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Fig.1

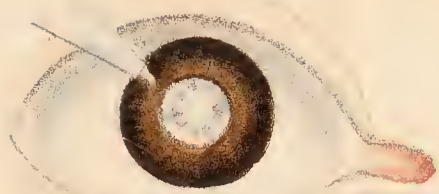


Fig.2



Fig.3



Fig.4

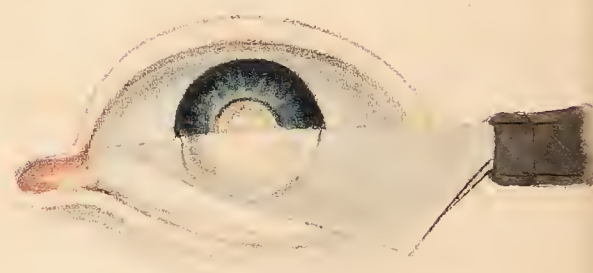


Fig.5



Fig.6

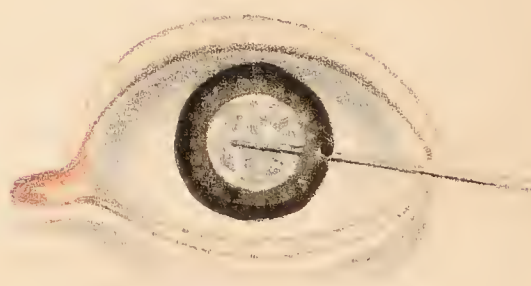


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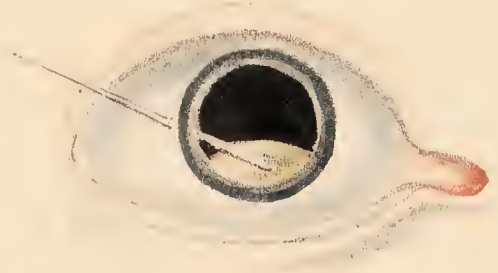
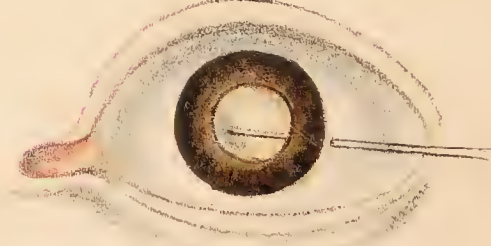


Fig.8



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Πειρασόμεσθα πῆματος τρέψαι νόσον.  
*ÆSCHYLI Agam.*

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## EDITOR'S PREFACE.

---

THE work, of which a second edition is now presented to the profession, obtained on its first appearance the unequivocal approbation which an exhaustive sale evinces ; and has long been out of print. Preparation for its republication had been made to some extent ; the introduction had been considerably altered, and in part re-written, and various emendations effected ; when fatal illness supervening, put an end to the author's prospect of personally accomplishing the object in view. He then proposed that his friend and former pupil should execute the task no longer practicable for himself. In pursuance of that suggestion, and in grateful memory of kindnesses for a long series of years unintermittingly exercised (not displayed) ; in especial acknowledgment of this spontaneous token of attachment and affectionate recollection, at an hour of solemn anticipation, when few men extend consideration beyond their own absorbing cares,—still fewer, beyond the sphere of their immediate families ; finally, with the hope of in some degree enhancing the value, perhaps distantly sharing in the credit, of a work



already highly estimated, the Editor accepted the undertaking.

A three-fold duty thus devolved upon him:—he owed to the original writer, that his statements and opinions, nay, as far as possible his exact words, should be preserved:—to the readers, as in likelihood many might be younger members of the profession, that any obscurity or ambiguity should be made clear, any inadvertent omission be supplied:—and to all whom therapeutical error might haply condemn “*carere luce et pati carcerem tenebrarum*,” that any injunction of equivocal expediency should be reviewed and weighed. The Editor trusts that the succeeding pages may prove his faithful observance of these requirements.

The additional matter consists of a biographical notice of the Author; which, however imperfect, will probably be acceptable to those readers, who either cherished his friendship, or admired his talents or his worth. It originally appeared in the Medical Gazette and the Gentleman's Magazine, and is reprinted with the corrections which its first hasty preparation had rendered desirable.

Notes ancillary to the text have also been inserted: they are mainly of a practical bearing, and brief; for had a more comprehensive form been given them, the bulk of the work must have been augmented, and its essential character as a practical compendium of Ophthalmic Surgery have been violated. Conciseness and perspicuity are qualities, which, if duly combined, can scarcely in didactic composition be cultivated too



sedulously ; and with this conviction the Editor has throughout endeavoured to condense to as great a degree as seemed compatible with clearness,—a course no less in accordance with the intention of the author, than with the approved advice of Horace, in his epistle *De arte Poetica* :—

“ Quicquid præcipies esto brevis ; ut cito dicta  
Percipiant animi dociles, teneantque fideles.  
Omne supervacuum pleno de pectore manat.”

Commending the entire volume to the indulgence of critical readers, the Editor concludes with the hope, that his subordinate labours in connection with it may contribute to advance the objects professed in the succeeding graceful preface ; and that the reputation of his deceased friend may at least suffer no extenuation in his hands.

41, Finsbury Square,  
April 8, 1848.



## BIOGRAPHICAL SKETCH

OF

## THE AUTHOR.

---

JOHN MORGAN, Esq., late surgeon of Guy's Hospital, and author of the present work, was born at Stamford Hill, on January 10th, 1797. His father, William Morgan, originally studied physic, but subsequently turned his attention to the subject of Assurance. He produced a volume on the doctrine of Annuities, and an "Examination of Dr. Crawford's Theory of Heat and Combustion"; and long held the actuaryship of the Equitable Insurance Office, a situation to the present time filled by his son Arthur: he was a native of Glamorganshire.

John Morgan, having received his general education at home, commenced his professional studies, at the age of 16, as an apprentice of the late Sir Astley Cooper, at the then united schools of St. Thomas and of Guy; and having passed the period of pupillage, conjointly with Mr. Key performed the duties of demonstrator of anatomy at a private school in the immediate vicinity of the hospitals. He had obtained the diploma of the Royal College of Surgeons in 1820; and in 1824,

at the early age of 27, was, on the retirement of Messrs. Foster and Lucas, elected surgeon to Guy's Hospital, at the same time with Mr. Key his coadjutor in the dissecting-room.

For the first year after this appointment, Sir Astley Cooper was Mr. Morgan's other colleague, whose subsequent resignation occasioned the vacancy supplied by Mr. Bransby Cooper. The lectureship upon Surgery at Guy's Hospital now, in part, devolved upon the author; who retained it many years, but latterly confined himself to the delivery of a course of ophthalmic surgical lectures. He was elected a Councillor of the College of Surgeons in 1843.

When first established in practice, Mr. Morgan paid much attention to the subject of comparative anatomy, in connection with which circumstance it may be mentioned that he undertook the dissection of the elephant shot in a rabid state at Exeter 'Change, and made numerous anatomical preparations from it; these, with many others of value, the works of his scalpel, are deposited in the museum of the Hospital. He likewise made one of the best collections of stuffed birds of British species ever formed; but advancing in practice, and having his leisure time more occupied in the domestic circle, he disposed of this collection; and it is now preserved in the Museum of the Philosophical Society of Cambridge.

As a surgeon, the author was distinguished beyond many of his early contemporaries for the attention he bestowed upon medical surgery; a subject formerly treated with much neglect. He was careful to investi-



gate, and remedy if needful, the constitutional condition of his patient ; and although, except on emergencies, evincing a wholesome tardiness in resorting to the knife, was bold, unflinching, and enterprising in his operations.

The reputation of an operator is most justly founded upon his execution of the manipulations of ordinary occurrence : cases of hernia and lithotomy, of amputation of limbs, or removal of tumours, of restoration of lost or marred features, constitute the fittest, because the most frequent and important tests of his ability. Judged by criteria such as these, Mr. Morgan deservedly acquired distinction as one of the best operating surgeons in London : discriminating in judgment, ready in contrivance, intrepid and cool, yet skilful and rapid in action, he won both confidence and admiration ; still more, he achieved success.

But his conduct in routine practice did not constitute the author's only claim to celebrity as an operator. In the earlier period of his career, several cases of more than common difficulty and responsibility established his reputation beyond question. Thus on two or three occasions he removed considerable portions of the lower jaw ; several times he tied the external iliac artery ; and in one remarkable instance performed this latter operation, where great obesity, and a large inguinal hernia on the same side as the aneurism, formed most embarrassing complications. Ligature of the artery was, however, successfully completed ; and the patient was still living a short time since.

This operation, it is to be remembered, had not at that time become an ordinary occurrence, much less

had ligature of the carotid. A case in which Mr. Morgan tied the carotid was one of highly vascular nævus, bordering on, if not actually amounting to, aneurism by anastomosis: the diseased structure occupied the entire side of the face, and had previously been treated by ligature and the actual cautery. These plans having proved unavailing, it was thought right (bearing in mind Mr. Travers' successful case of a similar kind) to arrest the supply of blood to the morbid growth by obliterating the common carotid. The patient accordingly underwent this formidable operation, and recovered from it; but, unhappily, the expected benefit did not ensue.

In cases of amputation of limbs or the breast, the author pursued with much advantage the practice of maintaining gentle pressure (by the hand of an assistant or nurse) over the wound, for some hours after the operation, and then applying a soft warm poultice. Troublesome oozing of blood is thus prevented, as satisfactorily as by the insertion of a sponge; and both the pressure and subsequent poulticing are productive of great comfort to the patient, and materially conduce to union by adhesion. In operations of this kind he invariably employed platinum wire sutures, which possess the advantages of being little irritating, and of readily permitting examination of the wound, without any necessity arising for their removal on that account.

To the late Mr. Morgan, supported by the judicious approbation of the Treasurer of the Hospital, is mainly due the credit of establishing the Guy's Eye Infirmary;



which has now for many years afforded relief to thousands, and has thus supplied ample evidence of the value of that analogical method of considering and treating ophthalmic disease, which the author zealously inculcated and successfully practised. Under his auspices the Infirmary reached its present importance; and a multitude, who have received its succour, might emphatically apply to him the grateful apostrophe of Tibullus—

“Tu mihi curarum requies, tu nocte vel atra  
“Lumen!”

Mr. Morgan's literary productions were comparatively few in number, but uniformly stamped with marks of sound judgment and vigorous intellect. His papers upon the mammary organs of the Kangaroo, and the organs of deglutition of the Capybara, read before the Linnæan Society in 1828 and 1830, were published in the Linnæan Transactions, and proved him an original and intelligent inquirer in comparative anatomy. He was elected a fellow of that Society, and was likewise chosen a corresponding member of the Natural History Society of Paris. His investigation of the *modus operandi* of poisons, undertaken in conjunction with Dr. Addison, gave occasion to a publication wherein the pains-taking experimentalists displayed acumen of no common kind, and considerable argumentative power. The work, which appeared in 1829, forced itself upon the attention of toxicological philosophers and the profession at large, but cannot be said to have set the debated question entirely at rest.

In a lecture on Tetanus, published by request, in



1833, Mr. Morgan gave a graphic description of this fearful malady, and introduced to general notice the probability of a remedy being discovered in the Ticunas, or wourali poison of the North American Indians—a substance productive of muscular paralysis when placed within a wound. Tested in some of the lower animals, it seemed to exercise a controlling power over tetanus and certain analogous affections; but the writer is not aware that any medical man has hitherto ventured to employ it in the human subject.

The author was not a large contributor to Guy's Hospital Reports, having confined his communications to two or three of the earlier numbers. In 1841, a series of clinical lectures upon ophthalmic topics appeared from his pen in the Provincial Medical and Surgical Journal: but his principal work of later years was the present volume of Lectures on Ophthalmic Surgery, published in 1839. It were superfluous on this occasion to say more respecting it, than that the simplified views and condensed character of the work rendered it a real boon to the student: in it he found, as in the author's oral lectures, this special branch of surgery divested of the overwhelming burden of a licentious nomenclature, and restored to its proper position of affinity and correlation with general surgery. The best testimony to the estimation in which it was held is afforded by the necessity of this second edition.

The author married, in 1831, Miss Anne Gosse, of Poole, in Dorsetshire, and had by her seven children. For the last seven or eight years he chiefly dwelt at

Tottenham, maintaining a professional residence in Finsbury Square, to which place he had removed from Broad Street Buildings. A few weeks only before his death was he compelled to relinquish the active duties of the profession and the hope of republishing his Ophthalmic Lectures, by the occurrence of dropsical effusions from albuminuria. Thenceforth he rapidly sank, and expired on the 4th of October, in the 51st year of his age.

The abrupt close of this estimable surgeon's career created a widely felt blank ; for his professional talents were universally acknowledged ; the confidence he inspired and justified was great ; the unobtrusive beneficence he exercised, abundant. In public life admired and respected, in private beloved, he bowed beneath a gradual and almost painless malady, the surely fatal termination of which it was his melancholy advantage from the first to foresee. Hoc, relictis solatium, postremo referre decet ; quod tandem (Dei ut sperandum est gratia,) Illuminatus, confortatus, fide Catholica in Ecclesiæ Anglicanæ gremio obdormivit.



## PREFACE TO THE FIRST EDITION.

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THE following Lectures are published at the request of my pupils, and not from any wish on my part to appear before the profession and the public, as an author of what will, I fear, be considered by them a very imperfect work, on the subject of Ophthalmic Surgery. This admission will, I trust, shield me from hypercriticism. Neither as a lecturer, nor an author, do I put myself forward as a competitor for professional fame and distinction with those who have preceded me as public instructors of students on the science herein treated of, and as advocates for the connection of ophthalmic with general surgery. But having been repeatedly urged, publicly and privately, by many of my class, to supply them, by publishing my Lectures, with a short text-book for their guidance after entering practice, as well as during their studies at the Guy's Hospital Eye Infirmary; I now comply with their wishes, in hope of affording a permanent and perfect reminiscence of those instructions, which I have spent so many proud and grateful hours in offering to them. I cannot refuse to take all chances of good or evil which may await me, in acceding to the



wishes of my young friends ; laying myself open, as I doubt not I am thus doing, to the censure of many who, perhaps, from various causes may have expected something better than the present production.

My object has been, to describe, concisely and clearly, the more common and the more important diseases to which the eye is subjected, with what experience has taught me to be the best general treatment ; and to illustrate, as much as possible, the analogy between diseases of the eye and those of other parts of the body.

If a detailed account of every morbid appearance connected with the component parts of the organ of vision, minutely and classically described, be required, I must refer my readers to the works published on the subject by Travers, Lawrence, Mackenzie, and some others : I have no pretensions to oppose to the learned productions of those gentlemen the humble volume, which is now offered to the student of ophthalmic surgery.

Broad Street Buildings,

March 30, 1839.

# LECTURES

ON

## OPHTHALMIC SURGERY.

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### INTRODUCTION.

GENTLEMEN,—In commencing a Course of Lectures on Ophthalmic Surgery, it may, perhaps, be expected that I should, in compliance with custom, preface the practical and more important part of my subject by what is usually termed an Introductory Lecture. In so doing, however, I should only waste your time, and perhaps exhaust your patience; for as a matter of course, in an introductory address, I should be obliged to repeat the “oft-told tale” of every writer and lecturer on the science which now demands our attention; many of whom have most ably and earnestly insisted on its extreme importance. Moreover, each member of our profession, indeed every member of society, must unhesitatingly acknowledge the benefits conferred on their suffering fellow-creatures by the skill of the scientific and experienced ophthalmic surgeon. Need I, then, on the present occasion, occupy your time in reminding you of the blessings which we all

enjoy from the sense of vision ; of the frail tenure by which those blessings, ever subject to the disastrous effects of accidental injury or of morbid excitement, are held ; need I urge the more than professional duty you will owe to those who, trusting to your reputed knowledge of surgery, shall hereafter seek relief at your hands from some of the direst calamities with which it has pleased Providence to visit us ? Surely every one I am now addressing must be convinced by his own personal feelings of the value of the sense of sight ; and, consequently, of the deep responsibility he will incur in future practice, when, on his knowledge or ignorance, the restoration or destruction of the most valued of all our senses must in many cases depend.

These, you will say, are self-evident truths, carrying conviction with them : why, therefore, dwell on them at all ? Alas, gentlemen ! to what good result has their universal admission hitherto led ? Let any well-informed and impartial ophthalmic surgeon, in even moderate practice, honestly answer the question. He will then bear witness, that, increased and increasing as are the opportunities for the study of ophthalmic surgery afforded in our public institutions, and persevering as have been the exertions made for its advancement by individual industry and talent ; yet, notwithstanding, amongst the majority of medical practitioners in this country, the subject is to the present time a comparatively neglected one. Though in principle disclaimed, the popular prejudice is practically still paramount, that ophthalmic and



general surgery may fairly be considered distinct and separate departments of the profession.

To what are we to attribute this anomalous and unfortunate discordance between theory and practice? Partly, perhaps, to the circumstance, that the long established practitioner, in whose younger days this study was slighted and neglected, is now prevented by numerous, more pressing, and more profitable avocations, from repairing, by regular attendance on lectures and the practice of an Eye Infirmary, the defects of his early education. He takes up, however, in some leisure hour, a long-spun treatise on ophthalmic surgery; therein he finds a surprising variety of terms descriptive of common diseases, requiring perhaps the most simple treatment for their removal, but so mystified by the multiplicity of names unnecessarily bestowed upon them, that as a beginner he becomes confused and bewildered. Thus, disheartened by the marvellous extent of the nomenclature, he gives up the subject in despair, without having acquired any really useful information for his future guidance; but with the soothing persuasion that others far more distinguished in the profession are just as little acquainted with eye diseases as himself. Still, he knows, feels, and must acknowledge their importance, although reluctantly compelled to leave their study and treatment to the professed oculist, or the better informed of the rising generation who are to succeed him. Valid excuse for such deficiency cannot be found now; and I hope and believe none will ever be required by a student of Guy's Hospital; where an extensive Eye

Infirmary, forming a prominent part of the medical establishment, offers abundant opportunity for the conjoined study of ophthalmic with other diseases,—an opportunity which, I believe, you may seek elsewhere in vain.

I am at a loss to conjecture to what cause the long continued neglect of ophthalmic surgery, as an essential part of professional education, is to be traced; knowing, as I do, how generally, and with what industry and success, the pathology of almost every portion of the human body, save only that which forms the subject of these Lectures, has been, and still continues to be, studied. Every member of our profession, who has received his education of late years, is expected to possess qualifications for the performance of all or most of the important operations which may be required upon other parts of the body; and to betray ignorance in the diagnosis and treatment of the diseases of other organs, would, in the present day, be considered a professional opprobrium. But if the organ of vision becomes the seat of an ordinary disease, or the subject of an accidental injury, or if any of the common operations on the part be required, the case is entirely altered.

Thus a medical man may pass for a talented and learned physician, or for an excellent operator and scientific consulting surgeon, though, in the former case, he be unable accurately to distinguish the diseases of the eye one from another; or, in the latter, to describe, much less to perform, those operations which are required for the restoration of sight. If, therefore, the loss of this



inestimable sense be threatened,—if the most delicate organ in the whole system be the subject of disease, we are not, it would appear, to consider the case, strictly speaking, of necessity either a medical or a surgical one ; and consequently, we find that a separate branch of practice has not unnaturally originated. I cannot too strongly protest against this unwarrantable separation, and do hope that a time may arrive when the distinction between a surgeon and an oculist shall cease to exist.

Now it is true that the diseases of the eye and its appendages are numerous ; but it must at the same time be remembered, that they are easily known by obvious characteristic marks, and that their treatment is in most cases extremely simple. It is also true, that operations upon the eye require great coolness and dexterity in their performance ; but it is not less certain, that operations upon other parts of the body require the same degree of self-possession and tact on the part of the operator ; nor am I acquainted with any operation in which both manual dexterity and coolness are not required. If any one I am now addressing be unfortunately wanting in these qualifications, I not only recommend him to decline operations on the eye, but say that in practice he ought never to operate at all : let him choose some other branch of the profession, if he will ; but, for the sake of his own reputation, and the welfare of his patients, he should totally avoid operative surgery.

You have probably all learned that the organ of

vision is composed of a variety of structures necessary for the performance of its proper functions : in your dissections of the globe you have found transparent media formed to refract the rays of light, a nervous expansion spread out to receive those refracted rays and transmit their impression to the sensorium, and an external opaque membrane to protect the more delicate textures within.

The cornea and humours of the eye constitute the transparent media ; the retina is the nervous expansion upon which the refracted rays are received ; and the sclerotic, inclosing the choroid and iris, affords the opaque investment of these important parts. We find, also, that the transparent humours are enclosed in equally transparent serous membranes, and that the globe of the eye is connected with the lids by means of a mucous membrane—the conjunctiva.

As might be expected in so complicated an organ, we meet with a great variety of morbid phenomena : thus, in the mucous membrane of the conjunctiva,—in the serous membrane of the aqueous humour,—in the tendinous sclerotic,—in the muscle of the iris,—and in the nervous structures connected with these parts,—diseased actions are liable to occur, bearing analogy with those which we find affecting similar structures in other parts of the body. This circumstance I shall take occasion to point out more particularly when describing different forms of disease to which the several textures are subjected.

Now, Gentlemen, it must be obvious to every one, that the object in the treatment of diseases of the eye



is, in all cases and under all circumstances, either to prevent or remove obstruction to the passage of light through the transparent parts; or to preserve or restore the healthy state of the nervous apparatus in communication with the brain: for whilst the humours and cornea remain transparent, and of their natural form and consistence; whilst the pupil remains open, and the rays of light have their influence conveyed to a sound retina, optic nerve, and brain, the sense of vision must remain perfect. It is, therefore, upon a knowledge of those morbid actions which may lead to, or immediately occasion, disturbance of the healthy state of these parts, that the proper treatment of ophthalmic diseases must principally depend.

Thus, when inflammation occurs in the sclerotic, the iris, or the conjunctiva, we know that its long continuance never interferes with the functions of the organ, provided the diseased action is entirely confined to these structures; but we also know how rapidly the cause of injury and disorganization is carried from these membranes to the important deep-seated textures; and it is to prevent such a consequence that we are frequently called upon to pursue a plan of depletion in the commencement of superficial inflammation, which, to an inexperienced practitioner, would appear uncalled for by the apparent amount of morbid excitement. But the *prevention* of disease in the transparent and nervous textures, by anticipating and checking its progress from adjacent ones, is a point in practice to which the surgeon cannot pay too much attention; for a comparatively trifling degree of ex-

citement in the surrounding parts, may lead, if uncontrolled in the first instance, to disease and disorganization of the transparent and nervous textures ; consequences of neglect, which are now and then met with by all who have seen much of ophthalmic diseases.

In active diseases of the eye, there is one general rule, which you cannot remember too well : never to rest contented with merely checking the progress of the complaint ; never, if you think that pushing your remedies still farther will avail, allow a disease of the eye to remain stationary. In other organs, where you have neither the transparency nor integrity of a delicate tissue to preserve, nor an expanded sheet of nervous matter to protect from the slightest mischief, this may not be a point of such momentous importance. But, in active ophthalmic diseases, the delay of remedies for twenty-four hours will, in some cases, prove sufficient for complete disintegration of the organ.

Never, therefore, in any case, or under any circumstances, rest satisfied with watching day after day the partial control of ophthalmic disease. Unless under your treatment the disease daily diminishes, you may perhaps be doing the patient more harm than good ; for while you are watching, and waiting for more obvious effects from half measures, the controlled but unsubdued disease will be insensibly extending to important parts ; and when at length you have determined upon altering your plan of proceeding, either the functions of the retina may have been destroyed, or the condition of the transparent parts of the eye permanently changed. Remember, therefore, that in allow-



ing any acute inflammatory disease of the eye, which is remediable, to remain stationary for a day, you are endangering the safety of the organ. This rule may apply to acute inflammatory diseases of all important organs; but it is more especially applicable to those affecting the organ of vision.

Before I proceed to describe the symptoms and treatment of the different diseases of the eye, I wish you clearly to understand the particular object which I have in view in delivering these Lectures. In the first place, you will bear in mind, that it is not my intention to describe with what I consider to be the absurd minuteness of a professed oculist, all the trifling deviations from the ordinary forms of disease, which have been unnecessarily made the subject of separate descriptions and of separate names. It is my wish to generalize the subject,—to show you, by pointing out the analogy existing between the diseases of the eye and those of other parts of the body, that ophthalmic and general surgery are one and the same science. It is my object to prove how much the difficulty of discriminating and treating the different diseases of the organ has been overrated, and to point out the best mode of acquiring dexterity in the performance of those operations which are occasionally required. I will not engage to furnish you with the variety of names by which each morbid change of structure has been designated by former writers; but I think I may promise, that if you combine the practical information to be obtained in the wards of our Eye Infirmary, with the instruction conveyed in these Lectures, you will in

future practice be able to recognise the diseases in question, and consequently to suggest the proper remedies, by merely applying those general principles which guide the practice of every other branch of our profession.

With this view I shall proceed to describe the Diseases of the Eye, as it is usual to describe diseases of other organs; and shall begin with the ordinary effects of common inflammation upon the conjunctiva.

That this membrane bears a close relation to the mucous membranes of other parts of the body, is clearly shown by the anatomical peculiarities of its structure, as well as by the obvious purposes which it serves in the economy; and, therefore, if it be true that where a similarity of structure exists between the textures of the eye and those composing other organs in the body, a similar train of disease results from the same exciting causes; then every complaint to which the conjunctiva is subjected, will prove to be nothing more nor less than a common disease of a mucous membrane.

NOTE.—The author's position, respecting the analogy of diseases of the eye with diseases of corresponding tissues elsewhere, is fully borne out by practical observation, and ably illustrated by himself in succeeding pages. The editor, however, is desirous at the outset to guard the student against mistaking analogy for identity—a mistake which the author's paramount anxiety to enforce the former might possibly lead to. Affections of individual portions of the eye are, indeed, in strict analogy with affections of similar structures in other parts; but, owing to the modifications which such structures undergo



in becoming fitted for subserviency to a peculiar function, and for incorporation with an organ so delicate, intricate, and minute as the eye, certain modifications are likewise engrafted upon the generic characters and effects of disease. For, first, the eye requires from certain of its constituents a quality demanded by no other organ—transparency: secondly, the anatomical arrangement of its several parts is proper to itself alone: and thirdly, the essential delicacy of those several parts is extreme. These three circumstances impress the affections of the component parts of the eye with peculiarities which it is indispensable to bear in mind. To illustrate what is meant:—

1. The constant friction of the prominent ventricle against the pericardium commonly produces an opaque patch upon the former; but the heart is not the worse: constant friction of the apex of a conical cornea against the palpebræ produces an opaque patch likewise, calculated most materially to damage the eye. Again, inflammation will create opacity of any transparent texture, as the peritoneum, pleura, or distended tunica vaginalis; yet the respective membranes are not on that account less efficient: but let inflammation raise as it does analogous opacity in the aqueous membrane, cornea, or corneal conjunctiva, and the function of the entire organ is, *pro tanto*, suspended.

2. Owing to the anatomical dispositions of the mucous membrane of the eye, certain specific phenomena attend its affections; though these affections be essentially common to other mucous membranes: instance the effects of gonorrhœal inflammation. The sub-conjunctival cellular tissue fills abundantly with serous and firm fibrinous exudation; and slough of the cornea, resulting from its nutritious supply being thereby mechanically impeded, results; the eye being irretrievably spoiled: perfectly analogous tumefaction of the prepuce occasions phimosis, which may proceed to almost any extent, with temporary inconvenience only as the consequence. So, again, from the continual motion of surface over surface, the conjunctiva is sometimes under inflammation irritated to the production of a remarkable granular state, such

as we see in no other portion, however villous, of the mucous tracts ; simply because no other portion is under inflammation subjected to the same aggravating influence. Once more : if mechanical violence or ulceration cause an opening into the anterior chamber, the aqueous humour escape, and the iris largely prolapse, who will deny the analogy between this condition and that of prolapse of omentum through a wound or hernial aperture ? But—supposing that in neither case spreading inflammation arise—in the former, if unremedied, constant serious impediment to vision is of necessity produced ; in the latter, gastric or intestinal disturbance may be little felt, or not at all.

3. It requires few words to prove the modifying influence of the minuteness of the parts of the eye upon the effects of their generic diseases. To revert to an illustration already once mentioned : even were the occurrence of opacity in the peritoneum or pleura injurious to the functions of those membranes, a square inch or two of surface at least, (bearing so small a proportion to the whole), might without detriment undergo that change ; but opacity of a square inch of the cornea is palpably tantamount to utter blindness. And thus extensive inflammatory adhesions of the pleura may exist for years with little inconvenience, and only be discovered after the patient's death ; but two drops of organized fibrin from the aqueous membrane spread across his pupils, will render the same patient a blind man.

It is needless to amplify further ; for the proposition cannot be contravened, that although a striking analogy subsists between ophthalmic and general diseases, still it is neither true in principle nor safe in practice to regard the two classes as identical.

## CATARRHAL OPHTHALMIA.

SYMPTOMS AND HISTORY.—The first disease which I shall describe is Catarrhal Ophthalmia: let us see how far, with respect to it, the preceding statement is borne out by facts. We all know from personal experience the effects produced upon a mucous membrane elsewhere, by what is called a catarrh, or more commonly a cold;—when, from exposure to certain states of the atmosphere, a morbid action is set up in the Schneiderian membrane, in the fauces, or the bronchial tubes and larynx, the result of which is recognised as a “cold in the head,” “hoarseness,” or “sore throat,” according to the part affected.

Now, the consequences of catarrh affecting the mucous membranes of other localities are very similar to those which distinguish catarrhal ophthalmia. The first indication of this disease (the cause I have already mentioned as being the same as that giving rise to common catarrh)—the first symptom of catarrhal ophthalmia, is an uneasy sensation, or rather smarting, on one particular spot of the globe. If you see this disease in its commencement, and are guided in diagnosis only by the local and visible indications of morbid action, and the feelings expressed by your patient, you may probably mistake the case altogether, and conclude that some particle of sand, or other extraneous substance, is lodged in the part. The indivi-



dual will tell you that he suddenly became the subject of a sharp and smarting pain, precisely resembling that which arises from the introduction of a foreign body between the conjunctival surfaces; and no persuasion will convince him that a particle of dust or sand has not found entrance. You see that the eye is watering profusely; and, separating the eyelids, you perceive a spot of diffused inflammation on the conjunctiva lining the palpebræ, where Catarrhal Ophthalmia first shows itself. In a short time, however, the vessels of the whole surface of the membrane, including that covering the sclerotic, become injected with red blood; but remember, that in the very first stage of the disease it is common to find the conjunctiva of the lids almost exclusively affected.

Now it is important that you should know the distinguishing marks between inflammation of the conjunctiva arising from the impression of cold upon the surface of the body, and that which is occasioned by mechanical irritation,—between catarrhal ophthalmia, and inflammation of the conjunctiva produced by an extraneous substance. In some cases the diagnosis may be difficult and obscure, but in most the following rules will prevent mistake.

In Catarrhal Ophthalmia we frequently observe distinct inflammation upon that part of the conjunctiva which covers the lids, and upon that only. In those cases where inflammation of the membrane arises from the irritation of a foreign substance, this partial effect can never be produced; for the local irritant being placed between the conjunctiva of the



globe and that of the lids, will press equally upon both, and produce a corresponding degree of inflammation in each. In one case, then, both conjunctival surfaces will be necessarily inflamed ; in the other, one surface only may be the seat of disease.

Again, in addition to the general inflammation of the conjunctiva of the globe following the introduction of an extraneous body, you will notice that a copious secretion from the membrane and from the lacrymal gland is immediately and constantly poured out ; while in Catarrhal Ophthalmia this secretion is neither so profuse nor so long continued.

I do not mention these diagnostic symptoms as applicable to all cases, but in many they will be found conclusive ; for it often happens that in the disease I am describing, the inflammation of the conjunctiva of the lids precedes every other local symptom ; and this alone will at once convince you that mechanical irritation is not the cause of the complaint : intolerance of light is a concomitant of both kinds of conjunctivitis.

In its commencement at one point, and in the sensation of a pricking smarting pain arising thereat Catarrhal Ophthalmia may be compared to an analogous affection of the fauces : for frequently the first symptom of common inflammatory sore-throat from catarrh is a smarting pricking pain, referred to one point of the mucous membrane of the mouth, generally at the tonsils, and occurring only during the process of deglutition, because at that time only the inflamed surface is pressed upon and irritated. But when the conjunctiva is inflamed, it is constantly rubbed

and compressed; for the motions of the globe are unceasing, and the two surfaces of the membrane lie in close apposition: hence, the pain in this case is almost constant; while in the other it is only produced during the occasional act of swallowing: the cause and effect of morbid excitement, however, are the same in both.

As the disease proceeds, inflammation of the conjunctiva scleroticæ ensues, but is not in the first instance diffused; for in many recent cases you will see the surface reddened in patches, by partial distension of the vessels: in a little time, however, redness becomes general. The red vessels appear first at the peripheral portion of the conjunctiva scleroticæ, and gradually advance towards the front of the membrane; and their appearance is highly characteristic of the nature of the disease; as they are of a bright scarlet colour, are easily moved from their situation by the pressure of the finger or the motions of the lids, and are slightly elevated and tortuous. In sclerotic inflammation, on the contrary, the vessels are pink, straight in their course, radiating from the junction of the cornea with the sclerotic, and immoveably fixed in the tendinous structure which surrounds them.\*

From the number of vessels which become filled with red blood, in the manner just described, the conjunctiva at length presents a uniform bright scarlet appearance;† and ecchymosis beneath the membrane often supervenes.

\* Plate 17.

† Plate 1, fig. 1.

I have told you that intolerance of light and increased lacrymal discharge are amongst the earliest indications of the disease. These subside as soon as the general redness of the conjunctiva becomes apparent; when an altered secretion from the morbid parts constitutes an additional mark of the commencement of the second stage.

By this altered secretion you will generally be able at once to detect the nature of the case. It is poured forth almost entirely from the surface of the conjunctiva; and, like the secretion from the Schneiderian membrane under morbid excitement from a similar cause, commences at first as a thin semi-transparent yellowish effusion, gradually increasing in quantity as the disease advances. After a time, when the excited capillaries find a free outlet for their secretion, we observe that its consistence as well as quantity is materially altered: the discharge becomes thick and opaque, and assumes a yellowish-white colour.

The amount of catarrhal discharge varies in different individuals and under different causes of morbid excitement. In the milder forms of the disease, you may perhaps merely observe a whitish deposit at the roots of the eye-lashes and at the inner canthus. If the disease be severe, the morbid secretion will be poured over the cilia and lids, and by forming incrustations upon those parts, will frequently glue them together, so as completely to close the eye. The discharge becomes muco-purulent in very severe cases, which now and then terminate in the purulent form of inflammation, as sometimes occurs when a similar complaint



attacks other mucous membranes. The secretion, however, from the conjunctiva in pure Catarrhal Ophthalmia is mucous, and not purulent ; and it is by this morbid discharge that the disease is characterized.

As in catarrh affecting the nose and fauces, so in this conjunctival affection, the neighbouring and continuous mucous membranes not unfrequently partake, in a less degree, in the morbid action. Hence, a sense of weight, amounting in some cases to severe pain, is experienced at the situation of the frontal sinuses, and more rarely at that of the antrum maxillare.

The febrile excitement attending Catarrhal Ophthalmia is proportioned to the severity of the local affection. In very slight cases the constitution does not suffer : in severe cases we have the usual symptoms of pyrexia—rigor, accelerated pulse, deficiency of perspiration, heat of skin, headache, and a loaded tongue, with constipated bowels ; but in most instances the disease is remittent, the symptoms becoming milder during the day, and returning with increased severity at night. This last circumstance, together with the comparative absence of intolerance of light notwithstanding the highly inflamed state of the conjunctiva, and the morbid mucous effusion always present to a greater or less extent, distinguish ophthalmia produced by catarrh from every other complaint.

From neglect or improper treatment, acute inflammation may supervene and extend to the cornea or sclerotic ; but the specific character of Catarrhal Ophthalmia is not thereby altered ; for the complaint is in its commencement a true disease of mucous membrane ;



though liable, of course, like other morbid affections, to be modified by various contingent influences. Thus, as a neglected cold or catarrh may lead to the production of phthisis, or to the development of a strumous diathesis, or to other disorders of a different kind; so, every now and then, neglected Catarrhal Ophthalmia will lead to disease and disorganization of surrounding parts. The treatment, therefore, is important, not only in reference to the direct consequences of the complaint, but also to the serious effects of its unabated continuance upon adjacent structures.

TREATMENT.—In the first place the stomach and alimentary canal must be freely cleared by a brisk purgative, of which some preparation of mercury should form a part. If the tongue be loaded, and more particularly if there be any disposition to nausea, an emetic will be found useful in clearing the stomach of morbid secretions. The effort of vomiting does not produce the same injurious effects in this as in some other diseases of the eye; for the inflammation being entirely superficial, temporary congestion of the vessels, during the expulsion of the contents of the stomach, cannot interfere in the slightest degree with the nervous expansion of the retina. In acute inflammation of the deep-seated tunics it is otherwise; but emetics may always be given with safety in cases of pure conjunctivitis.

To proceed. Having cleared the intestinal canal, the next object is to abstract blood in quantity proportioned to the age and condition of the patient,

and the degree of morbid action. Venesection is hardly ever necessary in this complaint ; but where a young and plethoric subject has the disease in a very acute form, and threatening adjacent structures, it may occasionally be required in the first instance : local depletion, by cupping or leeches, is, however, generally sufficient.

As there is little, if any, disposition to irritability of the retina,—scarcely any intolerance of light,—and as a close covering to the eye usually produces aggravation of suffering, a bandage is undesirable : a light shade should be worn ; and the heat and light of a fire, and the strong light of a candle, should be avoided.

With regard to local applications, you will generally find tepid saturnine lotions the most useful. Sometimes, however, cold applications are more grateful : you will be guided, therefore, in the choice of these by the feelings of your patient.

The edges of the eyelids should be anointed with some unirritating ointment at night, to prevent their agglutination by the mucous discharge during sleep ; and the incrustations on the roots of the lashes should be removed by tepid ablution.

The constitutional remedies for Catarrhal Ophthalmia, in addition to those already mentioned, consist in diaphoretic and mildly purgative neutral salts. The object, as in common catarrh, is to restore the natural secretions of the body, and prevent extension of the local affection from a texture where it can do little mischief, to a neighbouring part, where it may produce the most injurious consequences. We therefore purge freely in the first instance, clearing the stomach by an

emetic, if necessary, and then promote the continued secretion and peristaltic motion of the intestines by a mild saline purgative daily; exciting the exhalent vessels of the skin at the same time by diaphoretics. In some cases, considerable assistance may be afforded by the use of a warm bath.

The above remedies are usually sufficient to cure the complaint in a few days. But if after this any slight inconvenience remain, the chronic irritation producing it will be removed by anodyne collyria and counter-irritants. A blister should accordingly be applied to the temple or nape of the neck; and equal parts of *Aqua Rosæ* and *Vinum Opii* be employed as a collyrium.

Catarrhal Ophthalmia is never produced solely by dyspepsia; as has been supposed. It must, of course, be admitted that a disordered state of the digestive apparatus will render the system more susceptible of impressions from common causes of disease; hence, catarrh, as well as Catarrhal Ophthalmia, is frequently preceded by every indication of dyspepsia; but another cause must be superadded to produce the train of morbid symptoms by which the two diseases are essentially characterized.

I need not occupy your time by drawing the parallel still closer between Catarrhal Ophthalmia and catarrh in general; for, from what has been said, the similarity must, I think, be obvious to all.

The disease I have described, like many others affecting the conjunctiva, is liable to recur; and will now and then, after that portion of the membrane covering



the globe has returned to its healthy condition, leave the palpebral portion thickened and discoloured by chronic inflammation. This state is called *Ophthalmia Tarsi*: in its more advanced and aggravated form, the Meibomian follicles, the glands secreting the eyelashes, and other adjacent textures, become involved; and a disease known by the name of *Lippitudo*, to which I shall direct your attention more particularly when speaking of diseases of the palpebræ and appendages of the eye, is the consequence. At present I need only repeat that chronic inflammation confined to the conjunctiva lining the tarsal cartilages is called *Ophthalmia Tarsi*, and that it is a frequent remnant of *Catarrhal Ophthalmia*.

MODE OF EXAMINING THE EYE.—Having thus endeavoured to make you acquainted with the appearances presented by catarrhal inflammation of the conjunctiva in its different stages, I think it may be useful to offer, in conclusion, a few instructions as to the best mode of obtaining a clear and satisfactory view of the morbid changes I have pointed out. To examine a patient's eye properly in this or any other disease, more particularly in those accompanied by inflammation, it is necessary to separate the lids, and expose the globe behind them in such a manner as to guard against the occurrence of irritation in consequence.

It must be manifest to every practical surgeon, that in order to determine correctly the propriety of adopting one plan of treatment or another in cases of inflammation, it is essential that no temporary excitement should be added to the diseased action already set

up ; in short, that the real specific character of the disease should alone be indicated. If consulted upon a case of strumous inflammation of the knee-joint, you would not consider yourselves proper judges of the peculiarities of the case, were you informed that just before your visit the patient had excited increased morbid action by walking or throwing the weight of his body upon the inflamed part. The habitual morbid condition of the joint being concealed by artificial excitement, you could give no correct prognosis, until under rest and proper remedies that artificial excitement should have subsided.

It might appear absurd to suppose that any medical man in his senses would throw a stimulating injection into an inflamed eye, as a preparatory step to obtaining a view of the globe. Yet many produce the very same effect which would result from so doing by different means ; namely, by awkward attempts to examine the inflamed organ. I speak of what I not unfrequently witness in practice ; and knowing how few of you are acquainted with the proper mode of proceeding, I shall take this opportunity of giving a few directions upon the subject. There are three different ways of opening the eyelids, represented in Plate 18 ; and although each of the diagrams is a caricature, I do not hesitate to say that many who see them would, if asked, mistake the right way for the wrong, and vice versa.

The usual mode in which a bungler makes the attempt is represented in fig. 1. Each thumb is placed on the margin of one tarsal cartilage, and pressure is

made down upon the globe; the orbicularis contracts powerfully from sympathy, and thus the conjunctiva of the lids and that of the globe are rubbed together, as the lids slide over the anterior part of the eye. The natural consequence must be obvious: when two inflamed membranes are rubbed and pressed together, of course the diseased action will be increased; and hence, when a successful effort has enabled the operator to draw asunder the lids in the manner I have now described, it is found that the previous vascularity of the part is very greatly increased by the pressure and friction.

This, then, is the most common mode of opening an inflamed eye improperly; and the consequences are always as I have stated.

The next diagram represents a less common, but still more injurious mode of making the examination; which consists in insinuating elongated fingernails between the lid and the globe, and thus clawing the inflamed surfaces asunder. That such an operation must necessarily tend not merely to produce temporary excitement, but permanent increase of inflammatory action, will not be doubted. Yet I know from experience, that this plan is practised too frequently, to be passed over in silence upon the present occasion; and probably before you are twelve months older you will yourselves observe an illustration of the error.

Having shown the consequences of an unskilful attempt to open an inflamed and swollen eye, I will now describe the proper mode of performing this very simple operation.



The object is to separate the inflamed surfaces of the conjunctiva of the lids and globe at the time of opening the eye, and to avoid making any pressure upon the part : this will be easily accomplished, unless excessive tumefaction oppose an obstacle, by gently drawing down the integuments of the lower lid towards the cheek with the fore-finger of one hand ; and, with the thumb or fore-finger of the other, drawing up the skin covering the upper lid towards the supra-orbital ridge : the third diagram represents this process. In opening an eye, carefully avoid throwing strong light upon it ; as, otherwise, the operation is sometimes rendered difficult, from spasmodic contraction of the orbicularis palpebrarum ; and in cases where the retina has been rendered morbidly irritable, temporary increase of vascularity will generally be the consequence of neglecting this precaution.

You may perhaps think I have laid great stress upon a comparatively trifling subject ; but experience will prove to you that minor points in surgical practice are of more importance than you may now suppose.

NOTE.—In a large majority of cases catarrhal ophthalmia is a purely local affection, and demands no further constitutional treatment than a gentle purgative. It is, however, particularly apt to occur in a mild form in suckling women, especially if the subjects of leucorrhœa, or if lactation have been protracted beyond the natural term, or if from any other cause the constitution be unable to meet vigorously the call made upon it. In such cases it is usual to find a constipated condition of the bowels ; and this may effectively be relieved, at the same time that general debility is combated, by a mixture composed of ten

or fifteen grains of carbonate of magnesia, six drachms of infusion of calumba, and the same quantity of mint-water. Various other medicines calculated to fulfil the same indications may probably serve equally well; the above is that which the editor is in the habit of prescribing with satisfactory results. A weak solution of nitrate of silver constitutes a local application which, from its universal efficacy in this disease, is almost entitled to the character of a specific. Two or three drops of a collyrium, consisting of a grain or a grain and a half of this substance dissolved in an ounce of rose water, should be instilled upon the inflamed membrane thrice daily, and generally the remedy acts with a degree of celerity and certainty in subduing the disorder in its recent stages, quite surprising to those unaccustomed to its use. As a rule, this application is not beneficial when intolerance of light is present; but it must be borne in mind that, in so far as intolerance of light is manifested, does a given case depart from the normal type of catarrhal ophthalmia, and assume the characteristic of the strumous disease: with this proviso, the practitioner may employ the above-mentioned collyrium in cases of catarrhal ophthalmia with the utmost confidence in its curative powers. Risk of inducing discolouration of the conjunctiva is only incurred by long-continued use of a solution of the strength now directed, or the employment of one containing a considerably larger proportion of the nitrate. But, for the disease under consideration, neither of these chances need be run, as a few days' continuance of the collyrium now directed is usually sufficient for the cure. In chronic cases nitrate of silver is less beneficial; while the objection to its use gathers weight, since long perseverance with local astringents is then required.

## APHTHOUS INFLAMMATION OF THE CONJUNCTIVA.

SYMPTOMS AND HISTORY.—In tracing the effects produced by various modifications of inflammatory action on the *membrana conjunctiva*, I pass on to a disease which, like the one just described, is of common occurrence ; but is more frequently met with in children, and those under the age of puberty, than in adults, and is rare in persons of advanced age.

This disease is closely analogous to aphthous inflammation of other divisions of mucous membrane, as of that of the fauces. It may arise from a great variety of exciting causes, and is frequently seen in combination with catarrhal ophthalmia, or with strumous diseases of the organ of vision ; but it generally occurs as a separate idiopathic disease, assuming, like other inflammatory complaints, an acute or chronic form. Strumous and cachectic persons are most prone to it. The symptoms are as follows :—At the very commencement there may be observed on the surface of the membrane a small raised whitish speck, around which radiate extremely minute bright red vessels, in form of a plexus, tortuous in their course, and occasionally in the first instance receiving no visible supply of blood from adjacent larger trunks. The reddened circle is then perfectly distinct ; and, if occurring on the *conjunctiva scleroticæ*, the cellular connection of which is compara-



tively loose, it can be distinctly proved, by moving the aphtha from side to side with the point of the finger, that no supply of red blood is sent to it through its base. After a time, a fasciculus of conjunctival vessels may be seen carrying red blood from the circumference of the globe to the aphtha, and its surrounding vascular zone ; but, at first, the zone is in rare cases circumscribed and distinct. Now of course you know that aphthæ or pustules in other parts are surrounded by a red margin, and have been told that this arises from the passage of red blood from larger trunks into those minute ramifications formerly carrying colourless blood. On examining the part, however, you see only a blush of inflammation, the vessels being too small to admit of examination without the aid of a strong magnifying power ; but when inflammation attacks the conjunctiva, and reddens that membrane, the fact of morbid vascular injection is proved by ocular demonstration. A still more interesting pathological fact, however, appears to be proved by one circumstance I have mentioned ; viz. that the change of the fluid contents of an artery from colourless to red blood under inflammation does not necessarily depend upon direct transmission of red particles from a larger trunk into the dilated capillaries. That such transmission does take place is undoubted ; but that the redness of an inflamed structure depends exclusively upon this mode of altering the colour of the circulating medium, is surely rendered more than problematical by the phenomena above described, which present themselves so clearly to our notice during the formation of a conjunctival

aphtha. We must suppose, in these cases, that the colour of the blood is changed in the vessels by some means superadded to the mere mechanical conveyance of red globules from the larger to the smaller arterial branches.

To pursue this subject further would be foreign to my purpose : I have merely made allusion to it now, as I think these morbid appearances bear strongly on a disputed point of great interest respecting the pathology of inflammation.

To return to the progress of Aphthous Ophthalmia. The contents of the white elevation or aphtha consist in the first instance of a semi-gelatinous watery fluid, composed of serum and adhesive matter. In the course of a short time it will be found to contain principally an adhesive deposit ; a true pustule, however, is not formed, suppuration not being a character of the disease, which resembles precisely the same complaint elsewhere.

The diagnostic mark, then, of aphthous inflammation of the conjunctiva is the appearance of one or more minute, circumscribed, round, and elevated spots of effused lymph, each encompassed by a plexus of red vessels. You will find that the most common situation of conjunctival aphthæ is at the junction of the sclerotic with the cornea ; but sometimes they are formed on the cornea, on different parts of the sclerotic, or on the lids.

The size of the aphtha will vary in different individuals. In cases where only one forms, you will generally find it larger than where there are a con-

siderable number ; and the surrounding parts will be less inflamed than when the aphthæ are numerous.

This complaint may terminate as follows :—In the mildest cases, even when the disease has been fully developed, a natural relief may be afforded by gradual absorption of the contents of the aphtha and return of the turgid vessels to their healthy condition, without the assistance of surgical treatment. In more severe cases the morbid deposit continues to increase, until the conjunctival covering yields ; when the deposit is washed away by lacrymal secretion. A slight abraded depression, however, indicates its former seat ; and the neighbouring vessels continue turgid with red blood, until the process of repair is complete, or nearly so. But if the disease be neglected, particularly when occurring in a strumous or cachectic subject, ulcerative inflammation is almost invariably set up, and extends to the subjacent cornea or anterior part of the sclerotic. Thus, from neglected apthous ophthalmia, it is by no means uncommon to have a spreading ulcer of the cornea produced. It may be taken as a general rule, indeed, that the nearer the aphtha is situated to the centre of the cornea, the more protracted and troublesome will be the after-consequences ; for the closer the connexion of the conjunctiva to the subjacent textures, the greater is the likelihood of ulceration following a breach of its surface.

TREATMENT. — When this disease occurs unmixed with any other morbid affection of the eye, the treat-



ment is remarkably simple; and unpleasant consequences may almost always be prevented by the following measures:—

The constitutional treatment of those cases, in which the disorder is uncombined with any other affection of the organ, may be described in few words. The general health is not necessarily in the slightest degree affected; but as we usually find the disease occurring in weakly children, who have suffered from various causes of debility, it is often necessary to administer tonics in diet or medicine.

The different preparations of cascarilla, calumba, or cinchona, in combination with an alkali, more particularly ammonia, may be used with advantage; and an occasional purgative will be found highly beneficial in addition. Strict attention to proper regulation of diet cannot be too strongly insisted on: in these, and indeed in all cases of disease, tonic medicines should be avoided when tonic diet can be substituted. If the digestive organs are performing their healthy functions, and no disturbance exists in the nervous and vascular systems, further than that which debility alone will occasion, regulate the diet of your patient, instead of overloading his stomach with bulky tonic drugs. Tonics and stimulants, in the way of medicine, may certainly be required sometimes; but not, I believe, so frequently as they are commonly given; and they ought never to be employed in cases where the secretions are vitiated or suppressed: when the appetite is natural, and the secretions from the alimentary

canal are healthy, tonic medicines will be found more beneficial to the compounder than the patient.

The local treatment is generally the most important ; and, when the aphthæ are numerous, and there is acute surrounding inflammation of the conjunctiva, comprises topical bleeding, and counter-irritation in the neighbourhood of the diseased part. Accordingly, we apply leeches to the temple, or cup. Blisters or issues may afterwards be necessary in very severe cases ; but an astringent collyrium is usually sufficient to excite the vessels to healthy action.

Either of the following formulæ will be found useful for this purpose :—

℞. Liq. Plumbi Diacet. ℥vj.  
 Aq. font. ℥xiv.  
 Liq. Opii Sed. vel Vini Opii ℥ij.  
 M.

℞. Argenti Nit. vel Zinci, vel Cupri Sulph. gr. ij.  
 Aq. font. ℥x.  
 Vini Opii ℥ij.  
 M.

Vinum Opii and Liquor Opii Sedativus, undiluted, are also beneficial as collyria, particularly in chronic cases.

These applications to the conjunctiva may be varied according to the condition of the organ ; and generally, by persevering with local remedies, the complaint

will gradually disappear. In conclusion, I may remark that this disease, which is often unaccompanied by either pain or intolerance of light, is very likely to recur from exposure to cold, and from a disordered state of the digestive organs.

NOTE.—The Author is fully borne out by the practice of preceding writers, in conceding a separate and distinct existence to aphthous inflammation of the conjunctiva: with deference, the Editor demurs to the propriety of doing so. There arise indeed, occasionally, aphthæ supplied with tributary fasciculi of red vessels, the only ones in the conjunctiva scleroticæ apparently the subjects of morbid enlargement; and the aphthæ, thus seeming to constitute the focus of the disease, have been deemed entitled to give name to it. But far more frequently aphthæ occur as an accidental complication in the course of catarrhal or strumous ophthalmia: their presence indicates no peculiarity in the case not ascertainable from other symptoms, and calls for no variation from the treatment which would otherwise be pursued. How, then, is the pathologist justified in immediately setting apart such a case from the large class with which, in general phenomena and requirements, it perfectly agrees, merely upon the ground of certain minute and circumscribed sero-fibrinous deposits having been produced?

The Editor is in the habit of pointing out such examples, not as specimens of a distinct affection, but as instances of “catarrhal ophthalmia with aphthæ,” or “strumous ophthalmia with aphthæ,” as the case may be; and believes that when the evidences of these diseases (especially of the former, in the *palpebral* conjunctiva), are carefully sought, the candid observer will very rarely have to note an example of pure aphthous inflammation. The advantage of simplifying the consideration of diseases to the extent warranted by their natural relations, provided no confusion be engendered, needs no comment.



## VARIOLOUS INFLAMMATION OF THE CONJUNCTIVA.

SYMPTOMS AND HISTORY.—Owing to the prevalence of small-pox in this country, Variolous Ophthalmia frequently occurs in practice; and you will find it not only a frequent, but a most intractable disorder. Even when a case is seen in the commencement, constant attention, and the most judicious treatment on the part of the medical attendant, are too often utterly unavailing; and when occurring in its most severe form the complaint inevitably terminates in total blindness. The degree of danger is known by the situation of the pustules; and when this cannot be determined, owing to the enormous swelling and closure of the lids, the nature of the discharge affords a guide.

Now, variolous eruptions may occur on the conjunctiva of the lids only, or over the whole surface of the membrane. In the former case, the damage sustained by adjacent tissues is usually repaired, without seriously interfering with the functions of those parts upon the integrity of which vision depends; but when the pustules of small-pox form on the conjunctiva of the cornea, that tunic is always permanently damaged; and frequently,—invariably, if those pustules are confluent,—complete loss of sight is the result.

To make the subject clear, I must treat it under two heads; and first describe Variolous Ophthalmia as it

affects the conjunctiva of the lids only ; secondly, refer to the consequences following extension of the disease over the whole conjunctival surface.

PARTIAL VARIOLOUS OPHTHALMIA.—In watching a case of small-pox, we observe the lids swollen and closed during the eruptive stage : in a short time, matter exudes from behind them, and becomes encrusted on their edges and on the eye-lashes, agglutinating and perfectly sealing the aperture between them. The swelling arises from the formation of pustules on the subjacent conjunctiva, the surrounding tissues becoming inflamed as the eruption matures ; and the purulent effusion, which occasions adhesion and closure of the palpebræ, is poured from the surfaces of the broken pustules. When agglutination is complete, the matter, no longer able to escape, is, together with the lacrymal secretions, which now increase in quantity, confined between the lids and the globe ; and, until proper measures are adopted to insure a free and constant outlet for it, the morbid discharge must, of course, create continued irritation of the inflamed mucous membrane ; additional suffering to the patient being the necessary consequence. The symptoms complained of are, a sense of fulness, smarting pain, and burning heat, each increased by moving the globe in the orbit, or attempting to separate the lids. If these symptoms, combined with the external indications I have alluded to, are the most severe and prominent features of the complaint ; and, more particularly, if, so far as you can judge, the

variolous disease in the membrane hidden from your view is keeping pace with that, which you can see in other mucous membranes and on the surface of the skin; if *pure pus* only is discharged from the eyelids during the progress of the disease, and the swelling of the lids begins to subside and the purulent secretion issuing from between them diminishes concomitantly with the decline of the pustules on the surface of the body; you may anticipate a favourable result, before you can even separate the lids, to learn the precise condition of the globe. Variolous Ophthalmia, when general and acute, is distinguished by far more severe suffering than that now described.

As the complaint subsides, swelling of the lids gradually diminishes; and in a short time they can again be separated, and the globe of the eye be distinctly seen. If those symptoms only have been present which I have mentioned, and the disease in the eye has kept pace with that on the skin in its progress to convalescence, and the cornea has escaped, perfect recovery will follow, and the sense of sight will not suffer in the slightest degree. The eyelids in the situation of the former pustules are, however, sometimes disfigured by cicatrices, producing an uneven edge to the tarsus, which may remain for the rest of life. The cilia, too, in many cases fall out, and are seldom restored. Trichiasis, or inversion of the eyelashes, is also a frequent consequence of variolous inflammation of the tarsal conjunctiva.

I do not think it necessary to enter upon the general subject of small-pox in a lecture on Variolous Oph-



thalmia. It is to be presumed that the local appearances of the disease on the skin, and the nature of the constitutional disturbance which accompanies it, together with a knowledge of the proper remedies, are already known to you. I shall, therefore, only describe the local treatment; upon which, extremely simple though it be, may nevertheless depend the favourable termination of the complaint.

TREATMENT.—Your object should be to prevent the occurrence of increased irritation of the inflamed mucous membrane, from the confinement of lacrymal and purulent secretion behind the agglutinated eyelids. This will be accomplished by frequent ablution with tepid water, or milk and water.

I have generally found the following collyrium, a portion of which should be injected warm between the lids, extremely useful and grateful to the patient:—

R. Aq. Rosæ ℥iv.  
Liq. Plumbi Diacet. ℥x.  
Liq. Opii Sedativi ℥j.  
M.

This, of course, can only be used after the incrustations have been removed, and a free passage has been established for the escape of the morbid secretions; and remember that the greatest care must be taken in this respect. By the plan now recommended, you will effect nearly all that local remedies can accomplish, in hastening a return of the diseased structures

to their natural condition. Considerable relief, however, is often afforded by puncturing the pustules.

GENERAL VARIOLOUS OPHTHALMIA.—When, instead of affecting the lids only, the eruption extends over the conjunctiva of the sclerotic and cornea, the disease becomes dangerous in the extreme: for, in addition to the formation of pustules, we have acute inflammation of the entire membrane; the whole constituting general Variolous Ophthalmia.

The swollen state of the lids will quite prevent you from seeing whether the globe also has become affected. The existence of acute Variolous Ophthalmia must therefore be determined by the following symptoms:—Intolerance of light even though the lids be closed, excessive lacrymal discharge, continued pain, aggravated on moving the globe in the orbit, and sensation of sand or gravel between the palpebræ. If you observe a bloody, greenish, offensive discharge, you may be sure the cornea is sloughing.

These symptoms, then, indicating general pustular inflammation of the external tunics, will lead you to anticipate the most serious consequences. The cause of danger must be obvious, when you consider that the disorder, as it affects the cornea, is precisely the same as when affecting the skin. In both cases we have a small spot, in which suppurative inflammation is first set up; and at which ulcerative or sloughing action follows. Hence wherever a small-pox pustule forms on the transparent cornea, opacity to a greater or less extent results, from the cicatrization of the ulcer

which ensues. If, therefore, a pustule form in the axis of vision, the function of the organ will be proportionately disturbed or destroyed. Should the ulcer be small, and cause only a small spot of opacity, the sense of sight will ultimately be little impaired; but if a large ulcer form, and leave a cicatrix opposite the pupil, loss of vision is inevitable. If the disease be of the most virulent kind, the sloughing process will create a large opening through the cornea, and allow the humours to escape: the globe then collapses; and, of course, the function of the eye is at an end. But if only a small ulcerated opening be produced, you will find that instead of general evacuation of the humours, the aqueous only will escape; and the iris being thrust through the aperture, prolapsus of that membrane is the consequence. Again, should the ulcerated opening through the cornea be too minute to admit the passage of the iris, the latter is simply pushed against the aperture, and adheres without protruding: the alteration thus produced is called *Synechia Anterior*.

Sometimes the layers of the cornea, having been thinned by superficial ulceration, give way and bulge; thus forming a permanently opaque projection, which is known by the term *Staphyloma*.

**TREATMENT.**—From the description I have given of the effects of small-pox on the organ of vision, you will gather that for acute variolous ophthalmia the most active plan of general and local depletion is indicated. But in many cases of small-pox such a plan of treat-



ment, owing to the diminished powers of the system, would be productive of the most pernicious consequences.

We have, then, only to choose between attempting to save the eye at the risk of life, or leaving that organ to inevitable destruction, by following those rules in practice which have been proved by experience to be the most beneficial for the constitutional disease.

In the most acute form of Variolous Ophthalmia, if the constitution will bear depletion, endeavour without loss of time to check the progress of the disease by general and local bleeding, mercurial purgatives, and warm ablutions, by preventing agglutination, and placing the patient in a well-ventilated room excluded from light; these are the remedies you must first have recourse to. If prostration of strength or other causes should forbid this plan, endeavour to effect your purpose by local bleeding and tepid ablutions; but in the majority of such cases the disease will damage or destroy sight. Do not, however, mistake the effects of small pox on the lids for acute Variolous Ophthalmia; nor bleed, either generally or locally, when the lids are merely swollen and glued together; for this is the effect of pustular disease on the palpebral conjunctiva adjacent to the cilia. But when, in addition to this swelling and agglutination, you find extreme intolerance,—profuse lacrymation,—sensation of sand between the lids,—continued pain,—and excruciating pain on moving the globe within the orbit,—then rest assured that by depletion alone the organ can be saved; for

such symptoms are indicative of suppurative and ulcerative inflammation of the cornea, with acute inflammation of other tunics. Thus the constitutional treatment in Variolous Ophthalmia must depend not only upon the urgency of the local symptoms, but also on the effect of the disease upon the powers of the system generally. The topical treatment in all cases consists of local depletion and tepid ablution.

From your knowledge of the progress of variolous eruptions, you will, of course, conclude that the disease on the conjunctiva keeps pace with that on the skin, appearing at the same time, and fading simultaneously with it. You may therefore be led to suppose, that when the pustules on the skin have formed incrustations, and those incrustations are falling or fallen off, the conjunctiva has escaped, and all danger to the eye is at an end. Such, however, is not the case : for after two or three weeks a variolous eruption will every now and then occur on the conjunctiva of the globe. This disease is, however, much milder than the earlier kind, and characterized by the following symptoms :—The lids not being so much swollen, the pustule on the cornea is visible from the first, and shows itself in the form of a small circumscribed opaque spot, surrounded by a hazy zone: the opaque spot increases in size, and in its centre a yellow speck appears, which soon becomes a perfect pustule.

When several pustules arise on the cornea at the same time, it is sometimes difficult to distinguish the separate opaque spots ; for their surrounding hazy

zones mingle together, and a general nebula is the result: a minute examination is then necessary to ascertain the exact nature of the disease. The other symptoms are redness of the conjunctiva of the sclerotic and of the lids, pain, and intolerance of light. The disease, therefore, is the same in kind, but less in degree: and accordingly suppuration and ulceration are the most common consequences of this modification, while the sloughing process rarely supervenes.

The treatment is the same as before; consisting of active and continued general depletion, which the patient usually can bear after the decline of the eruptive fever,—local depletion,—tepid ablution,—and removal to a shaded, cool, well-aired apartment. Remember, that by neglecting to pursue a strictly antiphlogistic plan of treatment, this mild form of variolous disease may be equally destructive with the acute.

NOTE.—It is only necessary to observe upon the preceding section, that the utmost emphasis must be placed upon the author's injunctions to refrain from general depletion, when the powers of the system are unequal to loss of blood. The more severe is the attack of variola, the more debilitated, *cæteris paribus*, will the patient be thereby; and, consequently, however desirable bleeding might be for the reduction of the local disease, the very circumstance, which chiefly contributes to render it desirable for that purpose, imperatively negatives its propriety on the higher ground of the exigencies of the constitution. These, of course, claim first and paramount consideration, as the author has been careful to avow; and, bearing them in mind, it will not probably be in many cases that the discreet practitioner



will, at the present day, venture upon venesection in this malady. It should not be forgotten, that either the opinions of medical men have undergone a change, or the tolerance of general depletion by the public constitution has of late years diminished to a remarkable extent. In point of fact, however, the plans of treatment demanded respectively by the constitution and a diseased part are seldom really at variance; and, in cases where they most seem to differ, due deference to the requirements of the former will occasionally lead to more correct recognition of the genuine local indications, from their unwitting but felicitous fulfilment.

## CARCINOMA.

The next disease of the conjunctiva which I shall describe to you is Scirrhus. Now, Carcinoma, or Scirrhus, is known to affect two only of the component parts of the organ of vision, namely, the conjunctiva and the lacrymal gland. The globe of the eye is frequently the subject of fungus, but never of true carcinoma, unless by extension from other parts.

Carcinoma of the conjunctiva is an extremely rare disease, and usually begins in the lining membrane of the lids, extending secondarily to the conjunctiva of the globe. It appears in the form of tubercular enlargements, characterized by scirrhus hardness. The surfaces of these tubercles become ulcerated and ragged, and an offensive ichorous discharge is poured out. The affection is always attended with acute lancinating pains and general cachexia.

In a case, which occurred a few years ago at St. Thomas's Hospital, this disease of the conjunctiva was combined with a similar affection of the lacrymal gland; the eye appeared shrunk, and the humours partly absorbed. The disease extended, and destroyed the life of the patient.

The treatment of scirrhus of the conjunctiva consists of course in its entire removal by excision; which, as in all cases of carcinoma, prolongs, but does not eventually save life.

## PURULENT OPHTHALMIA.

Purulent Ophthalmia has been divided into three kinds,—Purulent Ophthalmia of infants,—Purulent Ophthalmia of adults,—and Gonorrhœal Purulent Ophthalmia. Pathologically, this division is incorrect: for, by whatever cause produced, the disease is essentially, in all cases, a suppurative inflammation of the membrana conjunctiva; and whether following contact of gonorrhœal matter, or any other exciting cause, the diagnosis and treatment of the malady, where unmixed with other indications of morbid disturbance, is the same in subjects of similar age and constitutional diathesis. But although objection may be offered to a pathological division of the disorder into three kinds; yet this division must, for the sake of perspicuity, be adopted, in describing the symptoms and the different forms of remedy required.

### PURULENT OPHTHALMIA OF INFANTS.

HISTORY AND SYMPTOMS.—The first symptoms of Purulent Ophthalmia in infants are intolerance of light, redness of the edges of the lids, agglutination of the palpebræ from morbid secretion, and scarlet redness of the palpebral conjunctiva. The disease usually appears from the third to the fifth day after birth, and is always produced by contact of the conjunctiva with a gonor-



rhœal, leucorrhœal, or other morbid discharge from the vagina of the mother during parturition.

The disease commences in the form of acute suppurative inflammation of the conjunctiva lining the eyelids, and is quite unconnected at first with the globe itself. We rarely see it at this early stage; for the symptoms being generally attributed by the parent to a wrong cause, are overlooked or neglected.

It is usually in the second stage of the disorder that we are applied to for advice, and often when medical aid is no longer availing to save the organ from destruction. In this stage the severity of the symptoms is increased ten fold: the disease has extended to the conjunctiva of the globe, which presents a swollen and bright red appearance; a profuse discharge of pus is poured from the inflamed surface of the membrane over the face and linen of the child; and the eyelids (particularly the upper) become distended and discoloured by acute inflammation of their cellular membranous coverings.

The purulent effusion becoming inspissated glues the lids together, so completely sometimes as to prevent an external outlet to the secretion, which consequently collects between the lids and the globe. The colour of the discharge is usually yellow; but, in the most aggravated forms of the complaint, it is of a greenish yellow, occasionally mixed with blood.

At this period of the disease, the orbicularis palpebrarum is strongly and constantly contracted; so that exposure of the globe is with difficulty effected. Now, the mode of separating the lids of a child the subject

of purulent ophthalmia, and the mode of performing the same operation in other diseases of the organ, and on the adult subject, are totally different.

In other cases it is desirable that the inflammation of the conjunctiva should not be increased by violence inflicted in attempting to open the eye by artificial means: but in Purulent Ophthalmia of infants it is quite impossible to effect your purpose in the way I recommended in a former lecture; for the conjunctiva is swollen and villous; chemosis of the lids exists, and the cornea is hidden by protruding chemosis.

The best mode of exposing the globe is to separate the lids quickly during sleep; but we are not always able to choose such a time for the operation, and therefore another course of proceeding must occasionally be adopted. It consists in pressing the margins of the tarsi backwards over the globe, by placing the finger-nails against their anterior edges. No force is to be used—no pressure *downwards*; the finger-nails are not to be *hooked* under, but placed against the anterior edges of the lids, which are then to be separated by gentle pressure. The introduction of probes between the palpebræ, or the use of a speculum oculi,\* may sometimes be required, if, from the tumid state of the part, or the irritability of the child, or any other cause, greater force is necessary than can be exerted by the finger only: often, however, we are compelled to rest our diagnosis upon the tumefaction of the lids, and the character of the purulent discharge issuing from beneath them.

\* Plate 16, fig. 18.

In this second stage of the disease, if inflammatory action be not checked, the conjunctiva of the sclerotic becomes raised in chemosis; the cornea becomes hazy, opaque, and sloughy, and ulceration speedily follows. A sloughing ulcer may be superficial, or may extend completely through the cornea; in one case, producing a white depression with ragged edges on the surface of the tunic; in the other, allowing free escape of the aqueous humour through the aperture left after separation of the slough. When the iris is pushed through and protrudes externally, the state is termed prolapsus iridis; partial escape of the vitreous humour follows; and the globe, consequently, collapses more or less within the orbit. In some cases, where neither slough nor ulceration of the cornea exists, adhesions take place between that tunic and the iris: indeed, partial adhesion between the cornea and iris is one of the common effects of purulent ophthalmia.

Such are the changes of the second stage; during which, if a slough or large ulcer has actually formed on the cornea, the eye may be considered lost; but if merely superficial inflammation, producing hazy opacity, has arisen, you may frequently succeed in saving the organ.

I shall enter more particularly upon the appearances presented by a slough or ulcer of the cornea, when speaking of the diseases of that tunic; in the meantime Plates 4 and 5 will convey a general idea of them. A prolapsed iris is represented in Plate 2.

The third may be considered as the convalescent



stage of purulent ophthalmia, for as in gonorrhœa, so in this disease, we find, that after running a certain course, suppurative inflammation wears itself out and gradually subsides. In this stage the swelling of the lids decreases, the discharge is lessened, and intolerance is diminished, so that the child begins gradually to open its eyes. We can now, therefore, distinctly observe the extent of mischief which active inflammation has produced; and the treatment must be varied accordingly.

Chronic thickening of the lids will every now and then remain for months after the other symptoms have disappeared; but it rarely occasions any inconvenience.

Generally two or three days elapse after the appearance of disease in one eye, before the other becomes affected; and, although the existence of a morbid secretion from the vagina will, in some cases, be denied by the mother, yet you may rest assured that it is the invariable cause of the complaint.

TREATMENT.—The object, in the first instance, is to lessen vascular action by depletion; and afterwards to excite the vessels of the inflamed and suppurating part to the performance of their healthy functions. If, then, being called to a case of this kind, you find the complaint only just at its commencement, you will endeavour to prevent acute suppurative inflammation, by the following local means :—

First, the eye should be frequently bathed with warm water, to prevent agglutination of the lids and collection of pus within them. This is a point of material con-

sequence ; for, if it be neglected, constant irritation results from the pressure of accumulated pus, while frequent observation of the condition of the eye is likewise rendered both difficult and painful.

Next, we endeavour to alter the action of the suppurating exhalent vessels by an astringent application. Different collyria have been recommended, and each may perhaps answer the purpose ; as solutions of sulphate of zinc, alum, sulphate of copper, or nitrate of silver, in the proportion of one grain to an ounce of rose water. A portion of one of these solutions should be injected three or four times in the course of the day, between the lids and globe, by means of a bone or ivory syringe ; and a piece of linen dipped in saturnine lotion may be constantly applied to the eye. These measures comprise the local treatment of incipient purulent ophthalmia in children.

The constitution suffers but little ; and, therefore, merely requires that the bowels should be kept regular by appropriate medicine.

As it rarely happens that we see the disease in infants in the earliest stage, so the plan of treatment which I have now described will seldom be sufficient for the cure ; generally we see it in the second stage, when the lids are swollen and acute inflammation has been set up.

Now, the prognosis, in a case of this kind, is regulated as follows :—If a bloody ichorous offensive discharge issue from the eyelids, you may, without further inquiry, pronounce that the function of the organ will be seriously disturbed, or completely annihilated. That



ichorous sanious discharge is produced in these cases by one cause, and by one only—slough of the cornea; and sloughing of any large portion of the cornea may be considered as equivalent to total destruction of the organ. If you perceive a deep yellow or greenish yellow discharge, you may infer that very acute inflammation is existing in the part. If the discharge be whitish, a less degree of inflammation is indicated; and if such a discharge have not been preceded by a yellow one, the case will generally terminate favourably. But the only satisfactory grounds of confident prognosis are afforded by examination of the globe itself. When the cornea is clear and transparent, whatever be the condition of the conjunctiva, you may at once assure the parents that the eye is, in all probability, safe; as the disease is then usually completely under control, and the sight may almost always be preserved. A hazy appearance of the cornea is not necessarily an indication of an unfavourable result; for if the dulness of the membrane be only superficial, and confined to the conjunctival and anterior layers, it will disappear under proper treatment. If the cornea should be perfectly opaque, ulceration or slough, to a greater or less extent, will follow, and the eye will in consequence be damaged. These, then, are the rules to guide you in forming a prognosis.

The treatment of Purulent Ophthalmia, in the second stage, may be comprised in few words, for it is extremely simple. It consists in local depletion, the application of saturnine lotions and tepid



fomentation, and the occasional exhibition of mild purgatives, of which some mercurial preparation should form an ingredient.

When you consider the tender constitution of the little patient, you will see the necessity for considerable caution in having recourse to blood-letting. The application of one leech to the upper eyelid will be quite sufficient ; for the effect produced upon the system of an infant by the abstraction of blood from a single leech-bite is sometimes powerful in the extreme. Possibly it may be necessary to repeat the application ; but in general a repetition is not called for.

The dose of calomel intended to act upon the bowels of an infant within the month, should never exceed one grain. This may be repeated, if necessary.

By these means, together with the injection of tepid water beneath the lids, and the application of a piece of linen dipped in saturnine lotion, the swelling of the palpebræ will, in a day or two, be diminished, and the other symptoms of acute inflammation begin to decline. If such, however, should not be the case, local depletion must be continued ; but the first bleeding almost always suffices to reduce the disease to a chronic form. When the purulent discharge, then, is diminished, the swelling is subsiding, and the child is able to bear the stimulus of light, depletion must be superseded by the use of local astringents ; and the case must be treated in the way pointed out as applicable to the earlier stage. Thus, in the first instance, we diminish acute inflammation by depletion,

and afterwards excite the suppurating surfaces to altered action by astringents.

In the third stage of the disease, when acute inflammation has ceased, and the process of restoration is taking place, it will occasionally be found necessary to support the system by tonics; for sometimes there remains on the cornea a ragged flocculent ulcer, which, indicating a disposition to slough, requires the exhibition of tonic remedies, like any other sloughing ulcer in a debilitated constitution.

I have only now to add, in conclusion, that blisters are in my opinion worse than useless, in any stage of the complaint. The analogy between this malady and gonorrhœa must be obvious to every one who has seen the two diseases.

#### PURULENT OPHTHALMIA OF ADULTS.

Purulent Ophthalmia in adults requires separate description; for various concomitant symptoms are complained of, the existence of which, in the case of infants, cannot be made known to us; moreover, it demands depletion to a much greater extent than the infantile disease.

CAUSE. — Great difference of opinion prevails amongst medical men respecting the causes of Purulent Ophthalmia in adults. By some it is supposed to be generally produced, like gonorrhœa, by contact

of pus with the mucous membrane. By others, again, it is considered that ordinary causes may give rise to this disorder; and that it is not consequently “specific,” *i. e.* resulting from the peculiar impression made by a local poison. No one doubts that gonorrhœal matter introduced into the eye is capable of producing the complaint; but the point at issue appears to be, whether more common causes of disease may not do the same. The solution of this problem is not of very great practical importance, since we all agree that the malady once produced is contagious, or communicable by contact; and therefore that those precautions should be observed, which are deemed necessary in other contagious diseases. Whatever, then, may be the cause of Purulent Ophthalmia, you should be careful to inform the attendants, of the dangerous consequences of allowing the discharge from the suppurating eye to come in contact with their own, in any way. That particular states of the atmosphere are favourable to the production and continuance of the distemper is, I believe, well known.

SYMPTOMS AND HISTORY.—As in infants, so in adults, there are three stages of Purulent Ophthalmia, viz.—

1st. When the disease commences.

2nd. When it is at its height.

3rd. When it is wearing or has worn itself out, and the patient may be considered convalescent.

In the first stage the lids only are affected; and the symptoms are, redness of the palpebral conjunctiva



from increased vascularity ; whitish muco-purulent discharge, small in quantity ; stiffness of the lids ; and a sensation as of some extraneous substance between them.

In the second stage, inflammation is violent and rapid in its progress ; insomuch that, when the whole surface of the conjunctiva has become affected, effusion of serum and adhesive matter into its cellular connections produces a degree of chemosis and general swelling of the lids, which renders it altogether impracticable to separate them and obtain a view of the globe behind.

Thus, in severe cases of Purulent Ophthalmia in adults, as well as in infants, it is frequently quite impossible to see the cornea or determine the condition of the globe ; consequently, as we cannot ascertain whether the disease has been carried beyond the reach of our remedies or not, the prognosis must, to a certain extent, be founded on conjecture.

In the milder forms of the complaint you may sometimes be able to separate the lids, so as to observe its effects upon the globe ; but in severe cases, and particularly in those produced by gonorrhœa, this is usually quite impracticable. The character of the purulent discharge, which streams profusely upon the face and clothes, then becomes an excellent diagnostic guide : if thin, sanious, offensive, and dark yellowish green, slough has taken place ; if yellow or white, a less degree of inflammation having occurred, possibly the cornea may have escaped permanent damage.

In this way an approximative opinion may be formed respecting the actual condition of the cornea and other tunics.

In acute Purulent Ophthalmia of adults, excessive and agonizing pain is complained of in the globe the orbit, and over the whole of the head. Hence, you may be surprised when I tell you, that in the severest cases, viz. those produced by inoculation of gonorrhœal matter; where enormous swelling, protrusion, and discolouration of the lids, profuse discharge of pus, and even slough of the cornea have taken place, not the slightest indication of constitutional disturbance arises, as an immediate and necessary consequence.

ANALOGY.—Now, when I began these Lectures, I told you I should be able to prove, that ophthalmic and general surgery are essentially one and the same science; and that for every disease of the eye, an analogous disease might be pointed out in other parts of the body, where we meet with similar constituent structures. I have shewn that Catarrhal Ophthalmia is merely the development of that morbid action in the conjunctiva, which we are every day in the habit of witnessing in the mucous membrane of the nares, fauces, trachea, and larynx.

I have now to prove that for Purulent Ophthalmia I can find an analogous disease elsewhere.

This Ophthalmia in adults, as in children, is purely a local malady, an acute suppurative inflammation of a mucous membrane; and it bears a close resemblance, in all its characteristic marks, to corresponding disease of the urethra. Purulent Ophthalmia and suppurative inflammation of the urethra are both produced, in their worst forms, by the application of



venereal matter ; in both, the degree of inflammatory action is indicated by similar characters in the appearance and consistence of the discharge ; and a milder form of both is produced by various exciting causes.

In our treatment of Purulent Ophthalmia, and of suppurative urethritis, we are guided by the same general principles, and have precisely the same objects in view ; for in both cases, we first endeavour to lessen inflammatory action by depletion, and afterwards to produce altered action in the capillaries by astringents. The different nature of the parts respectively adjacent, however, renders it necessary to vary the activity of treatment in the two diseases ; as the textures beneath the conjunctiva are much more readily disorganized by inflammatory action, than the investments of the urethra.

Again, I may instance an affection of the mucous membrane lining the antrum maxillare, as quite analogous to that under consideration : the affection I refer to is commonly called Abscess. In abscess of the antrum, as in Purulent Ophthalmia, having reduced inflammation by depletion, and established a free outlet for purulent accumulation, by extracting a tooth and perforating the cavity, we likewise use astringents for the purpose of altering the condition and action of the capillary system, and substituting a natural for a morbid secretion. Injections, in cases of abscess of the antrum, are not made use of with the same object as in abscesses of other parts. For an abscess of the antrum is an accumulation of pus in a cavity lined by an unabraded mucous membrane ; and though we call the complaint



abscess, the term is misapplied. When we inject a common sinuous abscess, we do so with the view of stimulating the sides of the cavity to granulate; when we inject an antrum, our object is precisely the same as in cases of gonorrhœa and purulent ophthalmia; namely, to excite the suppurating exhalents to healthy action. Injection of astringents during the inflammatory stage is alike injurious in gonorrhœa, in abscess of the antrum, and in purulent ophthalmia; and of all the treatment is guided by the same objects: indeed, the analogy between suppurative inflammation of the conjunctiva, and suppurative inflammation of other mucous membranes, is perfect, both as regards sensible effects and necessary treatment.

TREATMENT.—The treatment of acute Purulent Ophthalmia in adults varies considerably from the treatment of the disease in children. I told you that in infants in the very first stage, before the lids become swollen, and when the disease is confined to the palpebral conjunctiva, you may frequently arrest its progress by astringent injections. In the adult, however, you must never for one moment think of making such an attempt; for the disease being less tractable, you will not be able to excite the suppurating exhalents to healthy action by astringents; but on the contrary, the stimulus of an injection will add to the high degree of inflammatory action already set up.

In adults, if you find a slight discharge, inflamed lids, and a sound globe, your prognosis should be as follows:—If your patient be of a healthy constitution,

and temperate in living, and if the disease have been communicated by some other person who is the subject of the disorder in a mild form ; if, in short, it be taken in time, and have not arisen from the poison of gonorrhœal matter, you may generally prognosticate a favourable result. But if the discharge of gonorrhœa be the exciting cause, you must be guarded in your prognosis ; for I assure you, that even in the very first stage of Gonorrhœal Ophthalmia, the most active and judicious treatment will in some cases entirely fail to check the progress of the disease.

Gonorrhœal Ophthalmia usually occurs in one eye only ; occasionally both become affected, and the second then suffers less than the first.

With regard to the details of treatment ; while in infants of a week old, a single leech to the eyelid is generally sufficient, in adults we not only abstract blood generally, but call in the assistance of every other potent means of lessening action and lowering the powers of the system.

In acute Purulent Ophthalmia, although the globe be perfectly sound, you must bleed your patient in the first instance until the pulse sinks, and the powers of the system are lowered—until syncope is produced : in short, the effect must be your guide, not the quantity of blood taken.

You are to recollect, that the system does not in these cases sympathize with the local disease : you are not therefore to consider, that when a pulse is beginning to become feeble and soft from venesection, it is time to desist ; your object is not to bring an excited ner-



vous and vascular system down to the standard of health, but to produce extreme depression, far below the standard of health, throughout the whole vascular system, and thus to diminish action in the capillary vessels of the inflamed surfaces.

The next part of your treatment should consist in clearing the alimentary canal, in exciting to increased action the secreting surfaces of the abdominal viscera, and in acting freely upon the cutaneous exhalents. You must therefore administer the most powerful purgative and diaphoretic medicines. Of the former, calomel in combination will be found the most useful, and should be added in large proportion to whatever other purgative you give. Having thus further lowered the powers and action of the vascular system, by establishing a large demand for sanguineous supply in the capillary vessels of the intestines, and having at the same time removed all alimentary matter in the stomach and bowels, from which fresh nourishment might be afforded, we next proceed to insure a continuance of the depression which profuse bleeding and active purgatives have produced.

Now, it must be manifest to the most superficial observer, that frequent repetition of the large bleeding I have recommended in the first instance, must in a few days be attended by dangerous, if not fatal consequences : the patient would be a victim to hæmorrhage ; yet, in some cases of acute Purulent Ophthalmia, it is necessary to depress the powers and action of the nervous and vascular systems throughout the duration of the disease ; to produce, in



fact, a degree of depression very little short of that occasioned by profuse and continued hæmorrhage. This will in most cases be accomplished by the exhibition of medicines which produce a nauseating effect. We all know from personal and painful experience, that a continuance of severe nausea produces a prostration of strength, both physical and moral, too frequently felt to need description. There may, perhaps, be some present, who have formed their ideas of the effects of nausea upon the system solely from its more sensible and apparent consequences; as, when they have seen its effect in lessening the resistance of muscular fibre, in cases of dislocation; or, when themselves by nausea deprived of that energy of mind and body they had previously enjoyed. I think it therefore right to mention in this place, that, when we exhibit antimonial preparations or ipecacuanha in acute inflammatory disease to keep up continued nausea, we do so with a view of acting not upon the stomach only, but also, through the medium of the stomach, upon the whole nervous and vascular systems. For, when this powerful impression is made upon the stomach, the nervous connection or sympathy existing between that organ and the sensorium conveys to the brain and nerves an influence, by which the powers of the vascular system throughout the body, as well as those of the voluntary muscles, are depressed.

It is by thus diminishing arterial action, that continued nausea influences the vessels of an inflamed part: the whole vital powers are for a time depressed, and the tendency to increased action in any one part is thereby materially diminished.

In those cases, therefore, of acute Purulent Ophthalmia, where the system has been drained by venesection, and where the safety of the organ is still threatened, you will find very marked benefit from the plan of treatment now recommended. The repetition of general bleeding is in many cases required; but in some instances, the patient, from various causes, may be unable to bear repeated general bleeding, and we must then trust almost entirely to the other means I have mentioned.

The first constitutional remedies to be adopted, then, are copious venesection, calomel purgatives, continued nauseants, and local depletion.

Now and then, when the patient is the subject of phthisis, or is convalescent from fever or other debilitating disease, active general depletion might prove fatal; and we are consequently obliged to rely upon local remedies, and milder constitutional treatment. If, then, the disease be in its least grave form, we may, perhaps, succeed by such means in saving the organ; but if characterized by great severity, the case is almost hopeless.

The local means of relief consist in freely applying leeches to the lids, constantly bathing their inflamed surfaces with warm poppy fomentations, and injecting tepid anodyne collyria. The patient must be placed in a cool, well-aired apartment; for a close room and impure air greatly tend to aggravate the malady.

By the above plan of treatment you may hope, in almost all cases, if seen at an early period, to check the disease. When, therefore, no disposition to increased



swelling of the lids exists, and the discharge is lessening, you may begin the use of an astringent injection ; but you must continue the antiphlogistic system as regards diet, and watch most narrowly for a recurrence of inflammatory action, which, of course, would again require general depletion.

Redness and swelling of the lids will continue after every other symptom has yielded ; but these may be removed by scarifying the conjunctiva, and continuing the astringent wash. When discharge has quite ceased, and not before, the patient may return to his usual habits of living.

Such is the constitutional and local treatment of Purulent Ophthalmia in adults. It will of course occur to you, that the active depleting plan I have recommended is uncalled for by the apparent urgency of the complaint. It may appear extraordinary practice, when a person applies to you with slight redness of the lids, and purulent discharge, but without any constitutional disturbance, to bleed that person till he faints, and afterwards keep him for days in a state of nausea. But when you know the ordinary progress of the disease,—when you witness the violence of the symptoms in its second stage, and discover its intractable nature,—you will be convinced of the absolute necessity of a plan of treatment which will securely curb it at once. Rest assured, that the safest plan is that I have recommended ; trust not to local bleeding and purgatives in acute purulent ophthalmia ; but bleed largely in the first instance, even before the conjunctiva of the globe becomes affected ; and, if necessary,



and the patient will bear general depletion, do not spare the lancet afterwards, nor forget the assistance you may derive from nauseating remedies.

We next come to the consequences and treatment of a more advanced stage of Purulent Ophthalmia. Now as it very frequently happens that we are quite prevented from obtaining sight of the cornea by enormous swelling of the lids and chemosis of the conjunctiva, we are often obliged to form our diagnosis, and frame our plan of treatment, upon general symptoms.

If the cornea has sloughed, there can be no necessity for active depletion, as it is utterly impossible to restore the eye to its natural function : our only object will then be to relieve local suffering. But, if there be no good reason to believe that the transparent cornea is permanently damaged, no direct evidence in the nature of the discharge that sloughing has taken place, it is right to presume that the case is within the reach of appropriate remedies ; and you will be justified in adopting, as in the first stage, the most active and vigorous depletion. If the disease, however, be not checked at an early period, it rarely happens that the organ can be perfectly preserved.

Bleeding, therefore, and every other means of lessening action, must be had recourse to, whilst there is a reasonable hope of saving the cornea ; and the extent of depletion must be regulated, as in the first stage, by its effect, and not by formal rules of practice. In a short time you will be able to separate the lids, and ascertain the condition of the globe : should it then be unequivocally manifest, that the transparency of

the entire cornea is permanently lost from ulceration or slough, it can answer no good purpose, and is worse than useless, to persevere in lowering the system and inducing debility; but local depletion, and anodyne fomentations, must be employed to mitigate local suffering, until the convalescent stage supervenes. If, on the other hand, a portion of cornea in the axis of vision remains transparent, the system of depletion should be continued, to prevent inflammation spreading over that part. In such cases there is a hope of partial recovery, although the organ will, in all probability, be materially damaged; still, where one eye is lost, even a damaged eye is no inconsiderable blessing.

While, therefore, there is a prospect of saving the organ, the treatment of the advanced stage of Purulent Ophthalmia is similar to that recommended in the first.

We have next to consider the treatment of the convalescent stage of this disorder, which may be comprised in very few words. When inflammatory action is subsiding, we have more to expect symptoms of collapse, than a reappearance of vascular excitement in the part; hence active depletion is hardly ever required. Excess or intemperance may, indeed, during the convalescent stage, reproduce active inflammation; but nature if unopposed tends to repair the injured textures, and a want of power rather than excess of action will be met with.

During the convalescent stage, then, the injection of mildly astringent washes between the still suppurating surfaces of the conjunctiva, constitutes the only local



treatment necessary : and these are applicable as soon as the bright redness of the membrane begins to fade, and the swelling of the lids sensibly diminishes ; long, therefore, before the palpebræ have returned to their natural condition. The nitrate of silver, either in solution as a collyrium, or applied pure to any ulcer of an unhealthy character, will be found extremely useful; and in the chronic form of the disease blisters to the temple may be required. The constitutional treatment consists in establishing or preserving a healthy condition of the chylopoietic viscera, and of the secretions generally, and in avoiding all causes of excessive vascular or nervous excitement.

Such, then, is the treatment necessary for Purulent Ophthalmia in the adult. I have already described the treatment of this disease in infants ; and you will see that although the measures necessary to arrest the progress of morbid action are different in the two cases, yet that the principle is the same ; depletion being first required to lessen excessive inflammation, and astringents being subsequently used to excite the affected parts to healthy action. Active depletion, both local and general, is necessary in adults ; while the application of a single leech to the eyelid is sufficient in infants under a week old ; and at the periods intervening between the ages of infancy and puberty, of course a corresponding proportion must be observed. Thus it is rarely necessary to abstract blood from the arm in very young persons ; and we generally find, at the age of three or four years, that five or six leeches, applied to the temples, will suffice. Your own judgment will



teach you to accommodate the treatment to the age and condition of the patient; for it is of course impossible to lay down general rules which will apply to individuals of all ages and states of constitution.

Purulent Ophthalmia in adults is apt to recur; when, therefore, a patient has recovered from one attack, make him acquainted with the probability of a second: months may elapse between the two, and the second is usually less severe than the first.

Purulent Ophthalmia occasions blindness, from the mischief extending from the conjunctiva to the cornea and humours. Thus, in cases of blindness from this disease, we almost invariably find that ulceration and slough of the cornea have, strictly speaking, been the cause of loss of sight, partial or general opacity of the cornea remaining in the situation where an ulcer previously had existed; and the degree and extent of opacity depend upon the size and depth of that ulcer.

Occasionally, the cornea, thinned by ulceration of its laminae, yields to the pressure from behind, and bulges forward, forming what is called staphyloma. Adhesion of the iris to the cornea, a condition known under the name *synechia anterior*, is amongst the common consequences of the complaint; it generally follows the approximation of the iris and cornea consequent upon evacuation of the anterior chamber by an ulcer or slough, and does not interfere with sight, provided no opacity exists in the axis of vision, and the pupillary aperture is clear. Opacity of the cornea is sometimes produced after the convalescent stage, by the inflamma-

tory action caused by thickened and granular lids : this, however, must arise from neglect, for chronic thickening of the lids may always be prevented from damaging the globe.

A curious remedy for Gonorrhœal Purulent Ophthalmia has been recommended by German oculists. Considering the disease to arise from metastasis, or the transfer of suppurative inflammation from the urethra to the conjunctiva, they recommend that the disease should be re-established in its original situation by inoculation : bougies are to be passed, fomentations to be applied to the perinæum, &c. Both the theory and practice are absurd, and too ridiculous to deserve further notice. Gonorrhœa and Purulent Ophthalmia are often both existing at the same time ; and the latter is produced by contact, and not in any case by metastasis.

Let me remind you, gentlemen, of the absolute necessity which exists in this, as in every other disease propagated by contact, for strict observance of those rules which may prevent the contagion from spreading. As medical advisers in public institutions where Purulent Ophthalmia becomes prevalent, take care that you insist upon the infected being entirely excluded from all communication with the healthy. Let the linen be washed in separate vessels, and even during the convalescent stages cautiously guard against a possibility of the conjunctival secretion of the affected coming in contact with the eyes of the healthy inmates. Your patients will often be benefitted by change of air, when convalescing ; and separation from one another, and a

thorough cleansing of their habitations, will frequently assist in checking the spread of the disease, which appears under peculiar circumstances to become epidemic. Remember that prevention is better than cure; and, therefore, pay particular attention to these precautions.

In concluding the subject of Purulent Ophthalmia, I may observe, that a modification of this disorder now and then occurs in gouty or rheumatic patients, and is called Arthritic Ophthalmia, or Arthritic Conjunctivitis. It differs from common Purulent Ophthalmia, in which the conjunctiva is at first the sole seat of inflammation; for the iris and sclerotic are almost always more or less inflamed from the commencement to the termination of rheumatic Purulent Ophthalmia; and it is usual to find gouty or rheumatic inflammation of some of the joints alternating with the complaint in the eye. Thus, after having undergone little amelioration from remedies, the suppurative inflammation of the conjunctiva, and inflammation of the iris and sclerotic, will sometimes suddenly subside; and the patient will as suddenly suffer from a transfer of the disease to some other part,—perhaps being laid up with gout or rheumatism in the joints of his extremities.

Rheumatic inflammation of the conjunctiva, then, is a compound disorder, consisting in a modified form of Purulent Ophthalmia, combined with arthritic inflammation of the deep-seated tunics. As I shall hereafter have occasion to describe the symptoms and treatment of rheumatic inflammation of the iris and sclerotic, I do not think it necessary to notice them



more particularly at present ; but shall only observe, that when combined with suppurative inflammation of the conjunctiva, the same treatment is required as in cases of mild Purulent Ophthalmia. A moderate degree of general and local depletion will usually reduce the complaint ; and astringent anodyne injections, or collyria, are to be used during its chronic stage. Occasionally the conjunctiva is not the only mucous membrane affected ; but a muco-purulent gleet discharge is at the same time secreted from the urethra : this discharge, however, like that of the conjunctiva, disappears when the disease is developed in the joints.

NOTE.—One of the greatest improvements introduced into the practice of ophthalmic surgery, by an assiduous and successful cultivator of it, the late Mr. Tyrrel, has reference to the subject of the above lecture. It can scarcely fail to strike an attentive student of the treatment just directed for acute purulent ophthalmia in the adult, that great exhaustion of the system, and lingering, perhaps permanent, prostration of the powers of the patient, must ensue from its enforcement. A man cannot be bled to syncope, and subsequently be bled again and again, “so as to produce extreme depression, far below the standard of health, throughout the whole vascular system ;” his system cannot be “drained by venesection” without sustaining a shock, from which the most lamentable ulterior consequences are likely to arise. Yet the author, in enjoining such severe depletory measures, did not step out of the line of practice formerly regarded as necessary for the cure ; for, “if ever,” says one surgeon of credit, “there was a disease in which blood may be taken away without limitation, it is this :”\* and these opinions were gene-

\* Bacot on Syphilis, p. 134.

rally held. Far preferable, however, is the advice of one of the latest writers upon the subject, M. Florio, chief surgeon of the Military Hospital at St. Petersburg, (who, however, appropriates with too slight acknowledgment the improvement of Mr. Tyrrel,)—"Il peut arriver que les phénomènes inflammatoires qui avaient perdu de leur intensité après une première saignée reparaisent vers le soir ou le lendemain matin, et s'aggravent malgré tous les dérivatifs; alors, et sans perdre de temps, il faut faire une nouvelle saignée, *pourvu toutefois que les forces du malade le permettent, et qu'il ne se présente aucune contre indication.*"\*

Since, unless the disease be seen in its very commencement, the most strenuous antiphlogistic measures do not, in point of fact, avail either to subdue it or save the cornea,—and since the complaint manifests a decided disposition to run a certain course, and then subside spontaneously,—it would seem the surgeon's better line of practice to direct his efforts to the protection of endangered structures, until that course has been fulfilled, rather than to place the ultimate enjoyment of health in jeopardy, by vain attempts to curtail it. To take blood at the outset, with the view of *moderating* inflammatory excitement, may be prudent; but to push depletion beyond the point which the powers of the system can well sustain, with the delusive hope of suddenly setting it at rest, is certainly not judicious. The persistence of suppurative inflammation of the conjunctiva, in all its activity, for one or two weeks,—with gradually diminishing intensity, for two or three more,—is only formidable, for the most part, from the danger to which the cornea is exposed thereby; and, could the integrity of this structure be insured, there is little in the malady to excite apprehension, or prompt to violent remedial measures.

Such measures, however, have been adopted under the influence of two theories, neither of which has succeeded in retaining, to the present time, the adhesion of the profession;—one, that

\* Descrip. de l'Ophth. Purul., p. 188. Paris: 1841.



the destruction of the cornea in purulent ophthalmia is effected by the corroding qualities of the purulent secretion; the other, (entitled to more attention) that it is produced, like certain forms of gangrene in other parts, as the direct consequence of intense inflammation. It were out of place to discuss these questions at length on the present occasion; suffice it to refer the reader to the paper in the twenty-first volume of the Medico-Chirurgical Transactions, in which Mr. Tyrrel originally promulgated his views on the subject.

The theory advocated in that paper ascribes the sloughing of the cornea in purulent ophthalmia to impeded nutrition. The conjunctiva and subjacent reticular tissue contain the principal channels of sanguineous supply to the cornea: hence, when the mucous membrane is raised in chemosis by extreme distension of the cellular structure beneath with fibrino-serous effusion, a direct and necessary effect is the arrest of the onward course of nutritive fluid to the cornea; mainly by actual compression of some of the vessels conveying it, but also, in part, from the abrupt inflection of others, contained within the substance of the conjunctiva, where, chemosed and overlapping the cornea, that membrane is turned back at an acute angle upon itself. The practice founded upon this theory (which well exemplifies the benefit conferred on practical surgery by correct pathology) consists in relieving injurious pressure by incisions through the conjunctiva made parallel with the general direction of the vessels sent to the cornea (that is to say, diverging as radii from it); and at the situation where the more important vessels may be least endangered, *i.e.* opposite the intervals between the recti muscles. The operation is performed with the help of an assistant, who elevates the upper lid to expose the globe as much as possible; the point of a small sharp bistoury is then inserted beneath the fold of distended conjunctiva overlapping the cornea (the blunt part of the instrument being towards that structure and the sclerotic); and thence cutting outwards, the surgeon freely, but carefully, makes several incisions in the



direction and at the situations just mentioned. The wounds immediately gape; and tension being thus removed, the vessels destined for the cornea are enabled to convey their contents unimpeded.

The Editor's experience leads him cordially to approve this measure; it is in itself quite unobjectionable; it is most salutary, if adopted before the transparency of the cornea is lost, and it promises to render a disease once disastrous alike in its intrinsic disposition, and by reason of the treatment deemed conducive to its cure, comparatively manageable. The various means calculated to assuage pain, to diminish tension, and to allay inflammatory action, should be attended to diligently as before. The great advantage of this additional remedy is, that, breaking the chain of causation by which mortification of the cornea is brought about, it disarms the disease of its most mischievous weapon, exonerates the practitioner from the assumed duty of arresting inflammation peremptorily, and so relieves him from the supposed necessity of bleeding repeatedly and largely, in hope of cure, but at the hazard of inflicting permanent injury on the constitution of his patient.

## STRUMOUS OPHTHALMIA.

ORIGIN.—Strumous or Scrofulous Ophthalmia may be defined as general inflammation of the conjunctiva and external tunics of the eye, produced by sympathy with a morbidly irritable retina ; the retina being the first seat of morbid disturbance, and increased vascular excitement being produced secondarily.

Now, before proceeding to describe the symptoms of this disorder, it may be necessary to point out the peculiar constitutional diathesis by which the subjects of it are characterized. When I tell you that this complaint occurs in scrofulous children, you may naturally expect to find the external indications of morbid susceptibility described by most writers and lecturers upon scrofula ; but in such expectation you would frequently be deceived.

Strumous Ophthalmia, like struma itself, has been too much connected in theory with those peculiar external marks which popular opinion has assigned as distinguishing characters of scrofula. It is true, that children of light or red hair, of delicate skin, and flabby muscles, are almost invariably predisposed to scrofulous diseases ; but other individuals, whose external characters are nearly the reverse, are equally so. Thus we frequently find both scrofula and scrofulous ophthalmia in patients with dark hair, dark eyes, and a healthy complexion. All children, and all families, are more or less disposed to scrofula ; but the latent

tendency is oftener and more readily developed in some than in others. A predisposition to scrofula is increased, and therefore frequently first manifested, by causes which tend to diminish the natural powers of the system ; hence the disorder is often induced by general debility. But debility and scrofula are very different ; for the extreme of debility will never give rise to the development of a strumous diathesis in some constitutions.

In such persons, neither the effects of excessive depletion, nor of severe local injury, will be attended by those peculiar characteristics of morbid action by which we recognize the presence of struma. In others, again, comparatively trifling general depletion, or injury (as to a joint, for instance), will give rise to a train of constitutional and local symptoms of a truly scrofulous nature. In yet a third class the disease will occur locally, when the general health and powers of the system appear perfect. Constitutional debility is an attendant upon scrofula, and may in some cases occasion its development ; but debility is not alone the cause of those phenomena which indicate the action of that disease upon the different tissues of the body. Scrofula is in itself a peculiar and separate malady, frequently mixed up and combined with other causes of disturbed action in the system, yet possessing proper specific characters obvious and distinct.

Strumous Ophthalmia begins in irritability of the retina ; and from sympathy with that morbid condition of the nervous tissue, inflammation is produced in other component parts of the organ of vision, particu-



larly in the conjunctiva. Now I presume you are aware that the stimulus of light, thrown in excess and for a continuance upon a healthy retina, will occasion increased vascular excitement in the different tunics of the eye, and give rise occasionally to the severest forms of ophthalmia. When, therefore, the retina is rendered morbidly susceptible, we find, as might naturally be expected, that the ordinary light of day produces a degree of excitement equal to that which an extreme stimulus creates in the healthy subject. We account thus for the appearance of sympathetic inflammatory action in cases of strumous ophthalmia,—inflammatory action, which, once set up in a strumous constitution, soon becomes confirmed disease.

**SYMPTOMS AND HISTORY.**—I shall now endeavour to make you acquainted with the symptoms and treatment of this complaint. You will recollect, that these symptoms generally occur in children, and in children of various complexions; not always in fair, bloated, flabby subjects, with white or red hair, and light eyes, but also in those presenting nearly the opposite appearance.

In cases of Strumous Ophthalmia the digestive organs are invariably in a morbid condition; and the first effect of this disordered state—the first prominent symptom as respects the eye—is intolerance of light. This does not arise from any positive disease of the retina, but from its increased sensibility, for the sense of vision is perfect, and the patient sees tolerably well in a darkened apartment; but an ordinary degree of light

produces the same effect as an excessive degree would do on a healthy organ ; and this intolerance of light is the strongest characteristic of the malady. Hence the eyelids are closed by spasmodic action of the orbicularis palpebrarum, and if you separate them by force you will hardly obtain a view of the cornea, which is drawn behind the upper lid. The brow is contracted, and also, sometimes, the muscle raising the ala of the nose and corner of the mouth likewise, so that the countenance assumes a peculiar appearance. The excessive intolerance induces the child to seek the darkest corner of the room, and the face of the patient, when in bed, is hid in the pillow or bed-clothes ; for even the light admitted through the lids produces, in severe cases, most intolerable suffering. By these symptoms, then, you may know at once the nature of the disease, when a subject of strumous ophthalmia is brought for your advice.

Now, during the first stage of the complaint, the eye frequently appears uninflamed until the stimulus of light is applied ; and this circumstance is strongly diagnostic of the malady. After a short time, inflammation is produced, partly from sympathy with the retina, partly from congestion of the vessels, owing to the position habitually maintained ; for the face is always held downward, and the head drooping. It must be evident that in such an unnatural position local inflammation will be increased by vascular congestion ; and, indeed, this posture is productive of injurious consequences to more important parts than even the eye ; for curvatures in the spine and other deformities have occasionally



resulted from it. Until the disease is controled, and intolerance of light diminished, no persuasion will induce the patient to alter that position in which alone some alleviation is procured; hence, the consequences and treatment of Strumous Ophthalmia are important in the extreme.

To proceed with the other symptoms. Even before the conjunctiva has begun to inflame, tears are profusely poured forth from the lacrymal gland and conjunctival membrane, but principally from the former. This lacrymal discharge is produced by the sympathy naturally existing between the retina and the secreting organs. It would appear that the tears in Strumous Ophthalmia are of a morbid quality; for the eyelids and face are inflamed and excoriated by the constant lacrymal discharge; but, whether the secretion is merely increased, or is also morbid in its composition, may certainly admit of question.

Excoriation and inflammation of the lids and face in these cases, constitute, however, no positive proof of an altered condition of the fluid; for continued lacrymal discharge would undoubtedly produce considerable excitement upon the sensitive skin of a strumous child, more especially since constant rubbing with the hands is superadded to other causes of irritation.

By some authors the tears of Strumous Ophthalmia are described as scalding hot. Their temperature is not really increased; but the term simply refers to the sensation experienced by the patient, from their passage over the inflamed or excoriated skin of the lids and face.



We frequently see this disorder in children prone to pustular cutaneous disease; and hence find that the irritation produced by lacrymal excoriations leads to the development of a distinct affection of the skin. One of the most common consequences, then, of Strumous Ophthalmia in children, is the production of pustules of porrigo about the inflamed and excoriated parts. This eruption will sometimes spread and form incrustations over the whole of the face and forehead; a state of disease which has been called by some *Crustea Lactea*, by others *Porrigo Larvalis*. The eruption now and then occurs in other parts, but generally is confined to the child's face and neck.

You must not suppose that *Porrigo Larvalis* essentially owes its origin under any circumstances to lacrymal inoculation; but local irritation from various causes will, in a system predisposed to the disease, give rise to its development. *Porrigo Larvalis*, however, frequently accompanies Strumous Ophthalmia, from the same constitution being prone to the two diseases, and so, when the latter is cured, the pustular disease may still remain.

Occasionally the mucous membrane of the nose becomes swollen and excoriated, and pours out an acrimonious secretion; efforts to sneeze are, therefore, frequently observed during examination of the eye. The absorbent glandular system is always more or less affected.

The most common symptoms of Strumous Ophthalmia, then, in its first stage, are intolerance of light, lacrymal discharge, inflammation of the conjunctiva, excoria-

tions, pustular eruptions, and sometimes a morbid condition of the mucous membrane of the nose. The conjunctival inflammation attending this complaint is in the first instance neither general nor acute. You will see fasciculi of vessels advancing from the circumference of the globe towards the cornea, and frequently terminating at its circumference in extremely minute vesicles. In the course of time, however, the conjunctiva covering the cornea participates; a reddish white haze commences at the circumference, and gradually extends towards the centre of the cornea; and diffused conjunctival inflammation becomes permanently established.

We next find that decidedly red vessels from the conjunctiva scleroticæ overshoot the margin of the cornea, and ramify over its anterior surface;\* and at their extremities, upon the cornea, minute vesicular elevations are produced. When neglected, these vesicles burst, and extremely minute and numerous ulcers follow, and give the cornea a rough scabrous appearance. The ulceration, thus commenced in distinct spots on the conjunctiva, extends to the cornea beneath, and produces a most serious morbid condition of the tunic: indeed, ulceration of the cornea, arising in this way, is one of the most common consequences of Strumous Ophthalmia. The cornea becomes dull and opaque around each ulcerated spot; and every now and then such an ulcer will penetrate the cornea, and cause evacuation of the aqueous humour; and the iris then prolapses through the aperture.† Inflammation next extends from the

\* Plate 2, fig. 2

† Plate 2, fig. 3.



cornea to the sclerotic, and, in rare cases, even to the iris. In the meantime, the conjunctiva covering the sclerotic and cornea becomes crimsoned and thickened by inflammation and effusion; and a disease which is called Pannus results.\*

It occasionally happens that ulceration of the cornea will weaken the coat so much as to allow of its yielding and bulging, from the pressure of the contents of the globe. Staphyloma is the term applied to the prominent corneal cicatrix in these cases, in which permanent opacity always remains.

From the disease long continued, an alteration is produced even in the sclerotic, the globe becoming in consequence somewhat altered, irregular on its surface, or generally enlarged. This irregularity is called Staphyloma scleroticæ; and general enlargement from increased secretion of humours is designated Hydrophthalmia. Vision is usually impaired or destroyed in these cases.

DIAGNOSIS.—From what has been said, you will see at once the distinction between the symptoms of Strumous Ophthalmia and of those other diseases which I have described. The intolerance of light without external redness, and the lacrymal discharge, are always distinguishing marks in the first stage; and in the subsequent stages, the concomitant indications of a strumous diathesis, the continuance of excessive intolerance, the peculiar conjunctival inflammation, commencing in a minute pustular or vesicular form, and affecting the

\* Plate 2, fig. 2.



transparency of the cornea by continuity,—these marks will afford guidance to a correct diagnosis.

PROGNOSIS.—Now, with regard to prognosis, when the whole of the cornea is perfectly transparent, and imperfection of vision and increased vascularity can be accounted for by the causes I have mentioned, you may generally expect a favourable result ; and indeed, if the cornea should be slightly hazed, but not perfectly opaque, and there be no appearance of deep or extensive ulceration in the axis of vision, recovery may in very many cases be reasonably anticipated. Where, however, you find large and deep ulcers on the surface of the cornea, or a white deep-seated opacity, extending to its posterior layers, I recommend you to give a very guarded prognosis; for large deep ulcers invariably leave opacity; and opaque deposit in the posterior layers of the cornea, from recent inflammation, usually terminates in abscess ; and in both cases neighbouring tissues will, to a greater or less extent, participate in morbid change of function and structure. A reddened appearance of a part or of the whole of the conjunctiva covering the cornea, need not induce you to give a positively unfavourable opinion of the case ; for vascular cornea, as it is called, is in many instances under the control of medical treatment.

TREATMENT.—Now, as morbid irritability of the retina is in all cases of Strumous Ophthalmia accompanied by, and probably dependent upon, a morbid condition of the digestive organs ; it follows, that our

most efficient remedial agents must be those best calculated to restore the alimentary canal to a healthy state. We therefore place our chief reliance on constitutional treatment: local treatment is in the first onset of the disease of comparatively minor importance. It is true, that the remote consequences of neglect or improper treatment require the greatest attention to the application of local remedies; but these are not equally valuable at first, when increased redness on the surface of the globe is temporary, and may be satisfactorily traced to irritability of the retina. The distinction between such transient vascularity, and continued inflammatory discoloration, is easily made by examining the eye, before a strong light has been thrown upon it; a necessary precaution very seldom attended to.

Suppose, then, we have a case of strumous irritability of the retina, unaccompanied by continued redness of the conjunctiva. Our first object must be to clear the alimentary canal of its contents by purgatives; and some preparation of mercury, combined with an active aperient, will be found the most useful. Our next object is to lessen irritability, dependent upon constitutional weakness, by a tonic plan of treatment, and at the same time to promote the healthy action of the different secreting organs; for, in this complaint, as in struma generally, there are diminished power in the system, increased nervous irritability, and vitiated or suppressed secretions. Purge, therefore, freely in the first instance; and afterwards, taking care to insure a free evacuation from the bowels twice in the course of



the week, follow those general rules respecting tonic treatment which I have already recommended.

If it is clear that continued inflammation of the conjunctiva exists, leeches and depletion regulated by the urgency of the case may be necessary ; but in the majority of instances where there has been no lesion of structure, purgatives and tonics will alone be required to perform a cure. The objection to the application of leeches in the first stage, must be obvious, when we consider that Strumous Ophthalmia is the result of debility excited ; if, therefore, that debility be increased by leeching, morbid sensibility must of course be increased likewise ; and we accordingly find, that the profuse application of leeches in the first stage of the complaint is generally followed by injurious effects. Be careful, above all, not to apply blisters or counter-irritants, if you can possibly avoid it ; for, though the application of a blister is sometimes serviceable, yet the highly irritable state of the absorbent system in strumous children frequently gives rise to inflammation and suppuration of the cervical glands, in consequence.

A warm bath is often beneficial ; and in very obstinate cases, small doses of opium, antimony, and mercury, given every night in combination, may be required. In such cases we usually find a hazy cornea, and minute red vessels overshooting its margin, or covering its whole surface :\* here the safety of the organ is threatened, unless the system is made to feel the influ-

\* Plate 2, figs. 1 and 2.



ence of mercury ; and, now and then, the establishment of continued nausea must be had recourse to, in order to lessen the inflammatory action.

In all cases of Strumous Ophthalmia tonics are needed during convalescence ; and locally, at the same period, tepid anodyne collyria are useful. The eyes must be excluded from light from the first ; flannel should be worn next to the skin, and every other means adopted to prevent the patient from catching cold. This precaution should be more particularly attended to with children ; especially those, the vanity and folly of whose parents, in endeavouring to show off their personal appearance by as much nakedness as decency will admit, have assisted in the production of scrofulous disease. Great advantage is obtained from general ablution or sponging, followed by friction every morning. When the temperature of the atmosphere and the state of the patient permit, it is best to use cold water ; and the risk of doing so may be much reduced by expedition in applying it, and by using but a small quantity : in other cases tepid but not warm water is allowable. Lastly, never keep a patient, the subject of Strumous Ophthalmia, all day long in bed, unless the complaint is combined with febrile disturbance in the system ; in this case it may perhaps be sometimes necessary.

NOTE.—The seat of intolerance of light (or photophobia, as it is not inaptly named,) in Strumous Ophthalmia, admits of question. The author, throughout, assumes the retina to be its seat, and even incorporates that belief in his definition ; but there are circumstances which render this theory very problematical, and

seem to point with no equivocal indication to the conjunctiva, or rather to filaments of the fifth supplied to that membrane, as the structure really in fault. It were out of place to enter at any length into this question, in a compendious practical work ; but the subject having been noticed, the reader who feels interest in the inquiry, and desires further information, is referred to a paper in the fifth volume of the Guy's Hospital Reports, in which some of the grounds on which the opposite theory rests are briefly recited. The Editor has the satisfaction of observing, that the arguments he there adduced are deemed valid by an authority of some weight ;\* although at variance with the opinions hitherto prevalent, and with those inculcated in the preceding pages.

In the treatment of Strumous Ophthalmia, the following suggestions will occasionally be found useful, as coming in aid of the judicious recommendations of the author. After the secretions of the digestive organs, which are commonly in a state of disorder, are rectified, as he has enjoined, by mild tonic purgatives (such as a mixture formed of rhubarb, soda, calumba, and mint water), with occasional doses of an alterative mercurial, (as two or three grains of Hydr. c. creta with rhubarb), tonics are immediately available, and usually of the utmost service. The most eligible, in the majority of cases, is quinine, in doses of one or two grains ; and three or four minims of dilute sulphuric acid may now and then be added to the solution of quinine with great advantage ; while if there remain a disposition to purging, some syrup of poppies may be joined with the mixture. Belladonna was habitually given internally by the late Baron Dupuytren, for the cure of Strumous Ophthalmia, (which with singular inaccuracy he described under the title of retinitis†) ; and it does seem to allay the distressing intole-

\* British and Foreign Medico-Chirurgical Review, vol. i. p. 84.

† Leçons Orales, vol. iii. pp. 310 and 376.

rance of light : but, even in the minute doses in which of course so powerful a drug must be given, (as the tenth or sixteenth of a grain of the extract), and even if more uniformly beneficial than it is, perhaps few surgeons would prefer the use of belladonna to that of safer, and quite as efficacious medicines. Obstinate cases, however, do occur, in which such an addition to the list of probably serviceable remedies is eminently desirable; and the same extract dissolved in rose water (3ss. ad 3j.) forms an admirable collyrium in certain cases of otherwise intractable photophobia. Severe counter-irritation, as above said, is much to be deprecated; but mustard poultices, and indeed sometimes a blister, behind the ear, (prevented from creating too great irritation, either by being applied for a short time only, or by the interposition of silver paper between the blistering plaster and the skin,) will relieve the intolerance in a striking manner. So, again, milder applications, more near the seat of disease, as the tincture of iodine painted over the brow and upper lid, or the stick of moistened lunar caustic passed rapidly over the surface of the latter, in obstinate cases of this complaint, render most valuable assistance. The two latter means seem most properly referable to the class of counter-irritants, though, in the proximity of the situation at which to be beneficial they must be used, they differ from the ordinary remedies of this class somewhat widely.

A very important point in the treatment is to reject altogether the use of bandages, which are commonly resorted to by the friends for the double purpose of excluding light and draughts of air. But their effect upon the inflamed organs is highly injurious; for they materially tend to maintain the disease by the production of heat, the confinement of secretion, and the neglect of cleanliness, to which they are accessory. A green shade, assisted, if need be, by a veil when the patient is taken abroad, will always suffice.

There is often much difficulty in obtaining a view of the globe, in cases where intolerance of light is extreme, without



artificial assistance ; yet it is essential, at least upon first seeing the patient, to effect this object. When simpler means, and persuasion fail, the desired end may always be accomplished in the following manner:—the surgeon, in a sitting posture, supports steadily the child's head upon his knees, while the nurse commands its hands ; he then gently inserts one extremity of the wire speculum\* beneath the upper lid ; and thus raising it towards the superciliary ridge, without creating any pressure on the globe, exposes the sclerotic and a sufficient portion of the up-turned cornea to view. The entire examination is completed in a few seconds. Can, then, the proposed exhibition of ether or chloroform to suspend consciousness, in order to facilitate the inspection of an eye affected with Strumous Ophthalmia, be otherwise regarded than as needlessly hazardous ?

\* Plate 16, fig. 18.

## CHEMOSIS OF THE CONJUNCTIVA.

CHEMOSIS of the Conjunctiva accompanies most of the acute, and many of the chronic inflammatory diseases to which this membrane is subjected. I have endeavoured to explain to you the nature of those changes in subjacent parts, which ordinarily occasion the complaint ; and, therefore, need not repeat what I have already said. I merely introduce the subject now, to state that this affection sometimes occurs altogether unconnected with acute inflammation ; and then presents the appearance of a semi-transparent membrane bagging forwards, as if filled with a gelatinous substance. This œdematous tumefaction is, for the most part, met with in old persons ; and requires merely the application of mild astringents for its removal : inflammatory Chemosis is depicted in Plate 13, fig. 1.

In some cases of Chemosis there is an appearance interesting both to the anatomist and the pathologist, as it affords to the former a perfect proof of the existence of a structure he might not be able by dissection to detect, and to the latter a guide for the treatment of his patient,—I mean Chemosis of the corneal Conjunctiva ; the occasional occurrence of which demonstrates, notwithstanding the impossibility of separating the parts in the healthy subject, that the conjunctiva

does form an anterior covering to the cornea. To the surgeon and pathologist, the occurrence of corneal chemosis gives an assurance that acute disease is not present ; for in acute inflammatory chemosis, the bagging forward of the conjunctiva scleroticæ conceals the circumference of the corneal portion of the membrane, at which place corneal chemosis almost invariably commences.



## GRANULAR CONJUNCTIVA.

It now and then happens, from continued or chronic inflammation, that the smooth surface of the conjunctiva lining the lids is raised into lobes or granules, and at the same time preternaturally reddened. This state of Granular Conjunctiva is occasioned by chronic irregular thickening of the membrane, and organization of adhesive matter poured, by previous inflammatory action, into the cellular tissue beneath; the membrane itself remaining entire without the slightest abrasion of surface. A granular lid, therefore, is not a granulating lid: but granular is simply the term applied to that peculiar appearance on the surface, produced by unequal and unnatural distension from inflammatory effusion in subjacent parts. The term "granulating" would of course imply a denuded or raw surface secreting granulations.

The granular projections when first formed are soft, and bleed readily under pressure; when of long standing they become firm, hard, and less vascular. Now, as it affects the lids only, this complaint might appear to be a disorder of trivial importance, which could never endanger sight. But a most severe and formidable disease, in more important structures, is the consequence of its long continuance; hence, a knowledge of the proper treatment is essential.

The part which suffers first from the effects of granular lids is the transparent cornea. This tunic, from the constant friction of the irregular surface, becomes inflamed, opaque, and vascular; and if the source of irritation is allowed to continue, it becomes abraded and disorganized, and thus total destruction of vision is the ultimate result.

A nebulous or diseased cornea, then, is a frequent consequence of granular lids; and a neglected case of this kind occasionally terminates in blindness. Now, the effects of the pressure of granular lids on the transparent cornea are sometimes erroneously attributed to other causes; and, therefore, lest you should fall into this error, I advise you, in all cases of diseased cornea, to pay particular attention to the condition of the palpebral conjunctiva, especially that of the upper lid. For the peculiar disease of the transparent tunic first shews itself on the upper part of the cornea\* to which the upper lid corresponds: a plexus of red conjunctival vessels, passing down from the circumference of the globe, overshooting the margin of the cornea, and sending extremely minute branches to vesicles which form on that tunic, rapidly burst, and leave a scabrous appearance behind.

After a very short time a haze appears; shewing that the inflammation on the surface of the cornea is extending to its deeper layers: a more opaque haze succeeds and spreads widely, the greatest degree of opacity still residing in the upper part. The whole

\* Plate 3.

cornea eventually becomes uniformly opaque and white, and surrounding structures partake in the morbid action.

Remember, then, that in all cases of granular lids, you have to look for the worst effects of the disease on the upper part of the transparent cornea ; and again, in every case of superficial inflammation of the cornea, if the appearances I have described are met with, you may rest assured that they owe their existence to the mechanical pressure of the eyelid.

Now with respect to treatment :—If active conjunctival inflammation is combined with a granular state of the lids, you may apply leeches, cup, and purge, placing the patient at the same time on low diet, and freely scarifying the lids.

When inflammation is not active, and the affection has been of long continuance, counter-irritation will be found useful. This may be effected by the application of either blisters, issues, or setons, to a neighbouring part ; but the general health of the patient must at the same time be attended to. It will be necessary, in addition to frequent scarifications, if the granulations are hard and in a chronic state, to excite the morbid textures to healthy action, and promote absorption of the granulated deposit by astringents : in some cases we find it necessary to excise the indurated granules with curved scissors.

The astringents I have found best are the *Liquor Plumbi Diacetatis*, applied pure, and a solution of *Argenti Nitras*, in the proportion of a drachm to half an ounce of water. In very obstinate cases you may apply pure



nitrate of silver to the granules with good effect : take care, however, in using it, not to stain the conjunctiva of the globe, which you will avoid by the following precautions :—

In applying the Argenti Nitras, or any other astringent, (fluid, solid, or unctuous) to a diseased eye-lid, first evert the lid, and hold it well away from the globe; dry its conjunctival surface with a piece of linen, and immediately make the application. Directly afterwards dry it again, and apply some mild unirritating ointment; wipe this off, and make the application of ointment once more. You may then be almost certain, that whatever astringent has been applied to the conjunctiva of the lid will leave that of the globe untouched; an object, the desirableness of which must be obvious, when you consider the effect strong local applications would produce upon the surface of a healthy membrane.

The various forms of astringent collyria already mentioned, may be used with advantage in cases of granular lids. I generally prefer collyria to ointments; but either are useful if properly applied, especially the mercurial ointment, and one formed of two drachms of nitrate of silver to half an ounce of unguentum cetacei.

NOTE.—Some little explanatory allusion to the rationale of Granular Conjunctiva, as given above, seems desirable in this place. To understand fully this peculiar morbid condition, the structural anatomy of the affected membrane in the state of health must be borne in mind. Now it seems quite established by microscopical observation, that the palpebral conjunctiva is possessed of a papillary surface, though the function of the

papillæ is not clear. Taking this fact in connection with the remarkable proneness of the same portion of the membrane to exhibit the granular condition (and that, too, at an early stage of inflammation), and with the character of the individual granules, the conclusion can scarcely be avoided, that Granular Conjunctiva, in many instances at least, consists in a morbid development, or hypertrophy, of the natural papillary structure of the membrane. Such hypertrophy, doubtless, is produced at first essentially by vascular congestion, and subsequently by interstitial fibrinous exudation; so that the description of the text comprehends in the main a true representation of the pathology of this morbid change, even upon the theory just recited. But many incipient cases of granular lid, wherein the nascent granules are firm, broad-based, sessile, and so little numerous that they might almost be counted with the naked eye, cannot without difficulty be referred to hypertrophy of papillæ spread like the pile of velvet over the free surface of the conjunctiva: and though, perhaps, they might be attributed to inflammatory enlargement of the follicles, (of which Valentin is singular among microscopists in denying the existence,) are yet much more easily reconciled with the simple views of the author.

## PTERYGIUM.

DESCRIPTION AND HISTORY.—This disease, the cause of which is not well ascertained, consists in an interstitial thickening of the conjunctiva of the globe, of triangular shape, and perfectly circumscribed. It commences in the form of a flattened, slightly elevated tumor, and advances from the circumference of the globe towards the axis of vision.\*

The base of the triangular growth is always at the periphery; and as the pterygium increases in size, the apex is gradually pushed forward, till it reaches the centre of the transparent cornea.

Pterygia have been described as fleshy and membranous; but the distinction between the two, made from the varying thickness and vascularity of these excrescences, appears useless in a practical point of view; for the treatment is the same in both.

When, therefore, from morbid interstitial growth, a thin, grey, semi-transparent, triangular thickening of the conjunctiva is produced, we call the formation a Membranous Pterygium: when more raised, thick, and vascular, we call it a Fleshy Pterygium: in the former we see vessels running in parallel lines from base to apex.

A Pterygium may always be distinguished from other diseases of the conjunctiva by its triangular form, by

\* Pl. 17, fig. 7.



the absence of pain or inconvenience, and by its mobility, so that you can raise it readily with your forceps.

Pterygia are of slow growth, and may occur at any age; they are most common in the middle or latter periods of life. Residents in warm climates are said to be particularly subject to this complaint.

A pterygium forms in the following way:—The disease, whether membranous or fleshy, invariably commences in the posterior part of the conjunctiva scleroticæ; either at the inner or outer canthus, or the upper or lower part of the eye. When arising from the inner canthus, it is generally placed behind the caruncula, which is not commonly involved. It first appears in the form of a small triangular flattened patch of thickened conjunctiva, perfectly moveable, and unconnected with the subjacent sclerotic.

The tumor, as it increases, advances from the circumference of the globe towards the cornea; the broadest part of the excrescence being uniformly situated posteriorly, whilst its apex approaches the axis of the eye anteriorly.

As soon as the narrow extremity of the pterygium has reached the margin of the transparent cornea, it begins to assume a less elevated surface; and continuing to increase, will advance to the centre; but a single pterygium, although opaque, never produces perfect blindness, for the disease stops short at the centre of the cornea, and does not pass over to the opposite side.

Pterygia are occasionally met with in both eyes;

they are of very uncertain growth ; sometimes from the commencement regularly and gradually increasing to their full size ; sometimes, after having reached a certain point, remaining stationary, and producing no inconvenience for the rest of life.

TREATMENT.—Unless a pterygium has encroached so far upon the transparent cornea as to produce indistinct vision, you will seldom find necessity for the application of remedies ; though in early life the deformity may induce the patient to seek relief. In either case the remedy is excision. Thus when from two pterygia coalescing, or from the growth of a single large one, the sight becomes impaired, it is necessary to remove the disease ; but if the tumor arises from the inner canthus, and is connected with the caruncula lacrymalis, or if it is attached to the transparent cornea, its complete removal is not to be attempted ; otherwise it may be cut out freely. We avoid meddling with a portion of pterygium overlapping the cornea, because the close connection of the two might render their separation dangerous ; and by experience we find, that when the corneal portion is left, after removal of the other part absorption takes place and dissipates the disease. When pterygium occurs at the inner canthus, the caruncula lacrymalis must unavoidably be involved in an operation for its complete excision : in such cases, therefore, to prevent unnecessary pain and delay, we leave that portion of the base which is attached to the inner canthus, and remove the remainder.

If we have a large pterygium to remove, involving the cornea or caruncula lacrymalis, or both, we perform the following operation :—

The lids being kept separate, and the globe fixed, by an assistant; the central portion of the pterygium is transfixed with a small tenaculum held in the left hand, and drawn forwards, so as to put its cellular connections with the sclerotic upon the stretch; a common phymosis knife is then passed behind the tumor, and a section made through it; and by continuing to draw the part forward, and making a second section in the same way, the central portion is readily and easily removed. When an entire pterygium is to be extirpated, the only difference consists in using a fine scalpel instead of a curved knife, and after the part is pulled forwards carefully dissecting it off. Bleeding should be promoted by warm ablution, as it will lessen the tendency to subsequent inflammatory action. Both eyes are then to be excluded from light; all violent pressure upon the globe is to be avoided; and tepid washes may be applied until the next day, when the lids may be separated to ascertain the condition of the organ.

When the eye is opened, the surface from which the pterygium has been cut will appear coated with a yellowish deposit, and the conjunctiva around will present a somewhat ragged and distinctly inflamed margin: this is the natural aspect of the parts after the operation.

The yellow surface is produced by inflammation of the wounded and exposed reticular textures, and not



by any change in the sclerotic : the latter is behind this yellow deposit of lymph and mucus.

The inflammation on the cut edge of the conjunctiva is produced by the salutary efforts of nature to repair the wound, and requires to be promoted rather than subdued.

In a short time the wound contracts and cicatrizes ; the cicatrix is at first opaque, but afterwards assumes a more transparent appearance, and is usually quite perfect in two or three weeks.

If the healing process should appear to be going on slowly, a stimulating collyrium may be required ; but this is rarely necessary.

The composition of the tumor varies. Sometimes it proves of an adipose, sarcomatous, or highly vascular nature ; in other cases it is of a fibrous or tendinous consistence.

PTERYGIUM PINGUE.—Occasionally a spurious form of pterygium occurs in old people ; consisting of small yellow steatomatous granules, situated beneath the conjunctiva. The disease has been called Pterygium Pingue ; but is totally distinct from the other complaint, and never requires removal or medical treatment.

One distinguishing mark from true Pterygium will be sufficient : the latter is always of a triangular, or pyramidal form ; pterygium pingue is circular or irregular.\*

\* Plate 7, fig. 7 & 8.

## STAPHYLOMA RACEMOSUM.

A TUMOR sometimes forms upon the conjunctiva, which, although not malignant, resembles very closely fungus hæmatodes. It is purple, lobulated, and highly vascular, and, projecting considerably beyond the surface, has been compared to a bunch of currants; whence its name.\* It occurs in the fore part of the globe, and is simply, in the first instance, an interstitial disease of the conjunctiva, somewhat resembling a nævus: the sclerotic and cornea may subsequently be involved.

This disease may be distinguished from fungus hæmatodes† by its superficial situation and limited extent, beginning as a small purple lobulated tumor, and retaining the same character throughout. The first indications of fungus are, on the contrary, in the interior of the globe.‡

The treatment consists in excising the tumor, or using caustic for its removal; but excision is always preferable. The operation hardly requires description; you have only to fix the eye, and, drawing the tumor forwards with a tenaculum, to excise the morbid growth completely with a scalpel or probe-pointed bistoury. The disease is not liable to return; the sight, however, is permanently destroyed after the operation, if not before it.

\* Plate 11, fig. 2.    † Plate 5, fig. 3.    ‡ Plate 11, fig. 1.

## INFLAMMATION OF THE CORNEA.

**SYMPTOMS AND HISTORY.**—Inflammation of the Cornea, like inflammation of other parts, may conveniently be divided into acute and chronic. Acute inflammation of the cornea is always a compound disorder, the sclerotic, and frequently the iris, being involved in the disease: the intimate vascular connection between these tunics will explain this circumstance.

The first symptom is a hazy appearance of the cornea, which, in idiopathic and general inflammation of the membrane, is invariably accompanied by the formation of a zone of red vessels, in the sclerotic and conjunctiva, around its circumference.\* As the complaint advances, the haze becomes more dense and whitish, until partial or complete opacity is produced; while the redness of the sclerotic increases, and the conjunctiva proportionately participates in the disease.

In severe cases the iris becomes inflamed; but this circumstance may escape detection, from the difficulty of seeing the iris through the hazy or opaque cornea. Pain in the globe and orbit, and intolerance of light, commonly accompany the other symptoms.

**TREATMENT.**—The treatment of Corneitis when neither ulceration nor abscess exists, should, in the first instance, consist in depletion: secondly, in making

\* Plate 7, fig. 2.



use of counter-irritation, and producing an impression upon the system by mercurials. General depletion is required in the acute form ; local depletion with counter-irritation in the chronic ; and as constitutional disturbance is not always present, we look principally to the local symptoms. In young persons under the age of puberty, cupping or leeching, with the addition of brisk purgatives, will usually be sufficient ; in adults of full habit, however, abstraction of blood from the arm, as well as local bleeding, is necessary.

As the disorder begins to yield, vascularity in the conjunctiva scleroticæ lessens ; the cornea becomes less opaque, and intolerance diminishes. After this, occasional application of leeches to the temple, and continued counter-irritants—as blister, seton, or issue—may be required. Stimulants in diet must be avoided, and the healthy condition of the digestive organs be attended to ; and in these, as in most cases of local disease, you will find it necessary to insure daily evacuation of the bowels by a saline purgative. It sometimes, however, happens, when the chronic state has supervened, and all indications of active vascular excitement have disappeared, that loss of transparency in the cornea remains ; a haze, usually thickest on the anterior part of the tunic, and arising from interstitial effusion and partial organization of adhesive matter, being still observable. This effusion, called nebula, is principally between the conjunctiva and the cornea, or between the anterior layers of the latter membrane.

Corneal nebula differs from the temporary opacity produced by active inflammation, in being the result of

gradual and slow effusion, and not being altogether created by an alteration in the circulating fluids of the capillary system. We have analogy for this, in morbid affections of the peritoneum, pleura, and arachnoid. The degree of vascularity in the conjunctiva and sclerotic, and the presence or absence of disease in adjacent parts, must guide your treatment.

You will frequently succeed in removing true nebula of the cornea, if recently formed, by mercurials: for nebula of long standing no remedies are known. It is only, therefore, in recent cases, before organization of the new matter becomes complete, that we affect the system by mercury, in order to remove an opaque spot from the axis of vision. In giving mercury, it is not necessary to salivate; the appearance of a red line on the gums will be sufficient proof that your medicines are doing all that is required; and if after a week or two no impression has been made upon the opaque spot, you will rarely succeed in your object. After this time, therefore, according to the state of your patient's constitution, either suspend the use of mercurials, or continue them longer: if however the transparency is reappearing, of course you should persevere until the cure is perfect.

Whilst thus endeavouring to induce a restorative action in the part, by the operation of mercury upon the system, you will find great assistance from the local use of stimulants or astringents. By these you may still further excite the absorbent and capillary systems; and the removal of the nebulous opacity will consequently be considerably hastened. There are many formulæ of astringent collyria advantageous in

these cases; but I have always found the mercurial most useful. The following are those I generally employ :—

R Hyd. Chlorid. gr. v.  
Liq. Calcis, ℥j. M.

R Hyd. Bichlorid. gr. iij.  
Liq. Calcis, ℥j. M.

By these constitutional and local means we frequently succeed in removing recent opacities of the cornea. You must be careful, however, in distinguishing the opacity of active inflammation from the chronic nebula I have described; for stimulating collyria are useful in one case and injurious in the other. Vascularity of the sclerotic, pain, and intolerance of light, are symptoms which forbid the use of stimulants, and indicate the necessity of depletion.

Such are the common symptoms, and such the treatment, of simple Corneitis. Sometimes, indeed, the consequences of the disease are different; and, instead of opacity, suppurative and ulcerative inflammation follows, and an ulcer forms on the surface of the cornea.

NOTE.—The prognosis with respect to opacities of the cornea must be drawn from an estimate of the age of the patient, the density of the opacity, and its duration; the younger the individual, the less dense the nebula, and the shorter the period of its duration, the better being the prospect of its entire removal. In young children the opaque cicatrix following actual ulceration is susceptible of perfect cure. It is not often, however, that resort to mercury, so as to affect the system, is called



for in the treatment of these cases. After the subsidence of inflammation, local measures are more to be depended upon; and in addition to the applications mentioned in the text, there are two which deserve especial notice. Calomel, inflated as powder upon the cornea, is, in certain cases of nebula in which vascular excitement has quite passed away, of excellent service; and the same credit is due to iodide of potassium dissolved in water in the proportion of six or eight grains to the ounce. Of the use of hydrocyanic acid vapour for the same purpose, the Editor has no satisfactory experience; but can recommend the remedies now named, together with those previously specified, as worthy of the fullest reliance.

## ULCERS OF THE CORNEA.

DESCRIPTION.—Ulcers of the Cornea are more frequently overlooked by those who have not paid particular attention to ophthalmic surgery, than many other diseases of the part. A healthy ulcer of the cornea is not attended by discolouration nor loss of transparency; it appears as a transparent pit or depression, frequently only perceptible in a side view.\* An ill-conditioned and inflamed ulcer presents a different appearance: the ulcerated depression exhibits a ragged edge and yellowish surface, with more or less surrounding haze or partial opacity. A sloughing ulcer is known by its flocculent, opaque, and discoloured surface; the slough being readily distinguished from the surrounding parts by its ragged and deadened opacity.

It has been asserted, that we can never detect pure pus upon the surface of a superficial ulcer of the cornea; and hence it has been supposed, that ulceration of the cornea is never attended by purulent effusion. But this opinion, founded upon the appearance of superficial ulcers, not upon general observation of the different morbid conditions of the cornea, is contradicted by the formation of true abscess in the tunic, which cannot be produced without absorption and suppuration. Whether the minute quantity of pus formed from an ulcer of the cornea be washed away, as fast as

\* Plate 13, fig. 2.

it collects, by lacrymal discharge, and thus escape detection ; or whether, instead of pus, a more transparent or serous fluid be poured out, is a question not yet satisfactorily settled. That the ulcerated parts secrete can hardly be doubted ; but as the precise nature of the secretion is not very material in practice, I shall proceed to the treatment of ulcers of the cornea.

TREATMENT.—As the disease may not be confined to the ulcerated spot, but may be connected with a morbid condition of the whole cornea or of other tunics, it is necessary, in these cases, to attend especially to the restoration of healthy action in surrounding parts. Ulceration is, as you know, the result of inflammatory action ; if, therefore, the exciting cause of an ulcer of the cornea be still present ; if by intense vascularity of the conjunctiva and sclerotic, and diffused haze of the cornea, the existence of acute inflammation be manifested ; of course antiphlogistic measures, either general or local, are called for. If a corneal ulcer present a sloughy appearance, want of power is, in most cases, obviously indicated ; and the common principles of surgery will teach you, that local stimulants and constitutional support are therefore required :—I say in most cases, because in some a sloughing cornea is accompanied by acute inflammatory action (the cause of the first development of the morbid change), and, consequently, requires an opposite plan of treatment. Generally, however, an ill-conditioned or sloughing ulcer of the tunic is accompanied by congestive atonic inflammation.



The only difficulty in the treatment of ulcers of the cornea consists in knowing the precise appearances they present ; for they require precisely the same means of remedy as ulcers in other parts. The best local application to an ulcer on the cornea is pure nitrate of silver ; but this is seldom required unless a slough has formed, or the floor of the ulcer appears yellow or brownish, while no disposition to healing action is apparent.

HEALING ULCERS.—I have endeavoured to describe the appearance of ulcers of the cornea under excitement ; it is now necessary to make you acquainted with their aspect when healing. I told you that an inflamed cornea always assumes a hazy appearance, which therefore generally indicates the propriety of depletion. From this you might suppose, that a white semi-transparent halo around an ulcerated depression of the cornea is proof of local inflammatory action requiring control from medical treatment. Such, however, is not the case ; a circumscribed haze about the edge of an ulcer shows that the healing process has commenced in the part, and that the work of repair is being effected by the neighbouring capillaries ; a circumscribed haze around an ulcer is, in short, the haze of health, and not of disease.

Now, of the numerous and beautiful illustrations of the natural adaptation of means to ends derived from pathology, a healing ulcer of the cornea is, perhaps, one of the most striking. We see, in these cases, the mode in which nature avails herself of distant resources for the attainment of her object : when the

vessels of the cornea are unable to effect the process of repair, the vessels of another part are called in to their assistance ; a plexus of conjunctival vessels forms, and extends itself across the sclerotic, and over the cornea, without giving off any branches until the ulcer is reached : to this part they are distributed, and here they pour out and organize adhesive deposit, and thus assist in repairing the breach produced by ulceration. After a time, the sides of the ulcer approximate, the cavity is filled up by soft grey matter, and a smooth surface of conjunctiva is formed on the spot ; the halo now disappears, and the red vessels having performed their destined office return to their former condition, and continue thenceforward to carry colourless blood.

In children, a superficial ulcer of the cornea will leave no permanent mark behind ; but in adults, if the ulcer has been of any considerable size, a whitish opaque spot will remain ever afterwards. Sometimes an ulcer will close up and heal without the appearance of a halo or red vessels ; large and deep ulcers, however, usually exhibit the appearances I have been describing. Sometimes an ulcer of the cornea will penetrate nearly to the membrane of the aqueous humour without injuring that membrane ; which, covered by an extremely thin layer of cornea, is consequently seen at the bottom of the ulcer, in the form of a round shining vesicle.\* If the membrane should give way, of course the iris will protrude ; otherwise

\* Plate 13, fig. 3.

the ulcer will, in the course of time, granulate and close up. The appearance of a shining transparent vesicle, therefore, in the floor of an ulcer, may be produced (without any morbid change in the granulations,) by a protrusion of the membrane of the aqueous humour, together with the posterior layers of the cornea.

An ulcer, then, of the cornea, may present either a transparent or a yellowish opaque depression; the degree of inflammatory action attending the disease being indicated by the degree of general haziness in the tunic, and by the redness of the sclerotic and conjunctival coats; intolerance of light, and a circumscribed semi-opaque zone round the ulcer, and a plexus of conjunctival vessels running thither, occasionally attending the healing process. The treatment consists in controlling vascular excitement by local or general depletion; counter-irritation being useful in the chronic form of the complaint; and the nitrate of silver being the best local application. In fine, we are guided by general principles; and treat an ulcer of the cornea, as we should an ulcer in any other part of the body.

NOTE.—Ulceration of the cornea being rarely, if ever, a primary affection, the treatment, for the most part, merges into that adapted to the exigencies of the disease which has led to it. There is a peculiar feature, however, connected with ulcers on this part; namely, that however intractable they may be for a certain time,—though the immense majority yield readily to judicious remedial measures,—yet from the period when perforation of the cornea is effected, the cases almost invariably make rapid progress to convalescence. It would seem, that the diminution



of tension, produced by the aqueous chambers being completely evacuated, is the immediate cause of the mitigation and progressive amendment which so directly ensue. Of course, this fact is not cited with the view of inculcating any laxity in the endeavour to arrest the advance of ulceration; nor as establishing, though it certainly suggests, the propriety of puncturing the cornea in certain cases: but when, as will sometimes occur, a deeply eroding ulcer upon the cornea resists the means usually found efficacious, and imminently threatens perforation; it is encouraging to know, that the mischief once accomplished, the surgeon may in all probability date the patient's relief and steady improvement from the moment of its accomplishment; and that, if anticipating and prepared for the event, he need not despair of altogether preventing ultimate injury to vision from its occurrence.

The application of belladonna is, under these circumstances, the principal adjunct to the measures previously requisite; and its beneficial action is irrespective of the position of the ulcer. For, if the aperture in the cornea be near the axis of vision, dilatation of the pupil palpably tends to remove the iris entirely from the danger of prolapse; while, if near the margin of the cornea, though dilatation cannot obviate the proximity of the iris, yet the general centrifugal contraction of that membrane, which produces dilatation, creates such draught upon the endangered or actually prolapsed portion of iris, as must materially counteract its disposition to protrude.

It is needless in this place to advert to the arguments which prove dilatation of the pupil to be, as just assumed, an active condition; further than simply to state, that, owing to this fact, the persevering use of belladonna will sometimes eventually succeed in detaching an iris partially adherent to the cicatrix of a corneal ulcer, even after the lapse of five or six weeks from the formation of that adhesion. The same fact is shown, in a still more striking manner, in the disruption of frænal adhesions between the iris and the capsule of the lens; the

force exerted upon which, prior to their giving way under the influence of belladonna, is plainly exhibited by their evident tension, and the deep festoons into which the free portions of the iris are drawn at the intervals of adhesion. Belladonna should, therefore, be applied, when perforation happens at any part of the cornea; and its use should be persisted in for many weeks after the aperture is closed, if synechia anterior is not sooner overcome.

## ABSCESS OF THE CORNEA, OR ONYX.

**HISTORY AND SYMPTOMS.**—Inflammation of the Cornea frequently terminates in abscess, which generally forms in the posterior layers, and bursts into the anterior chamber of the eye. An abscess of the cornea never contains pure pus, but pus mixed with adhesive matter, and more glutinous than that from abscesses in many other parts; still, some purulent effusion is a component part of the contents of the abscess.

Onyx or abscess of the Cornea shows itself first in the form of an opaque spot, surrounded by a zone of diffused haze: the anterior layers of the cornea are often comparatively transparent, whilst the opaque spot, indicating the situation of the abscess, is to be seen in the layers directly behind. This circumstance distinguishes abscess of the cornea from any other disease; for, while in other diseases producing opacity the anterior part of the tunic is equally opaque, and sometimes more so than the posterior, in onyx there is often (but not invariably) a transparency before the opaque spot.

When an abscess in the posterior layers of the cornea bursts into the anterior chamber, the matter sinks to the lower part, and produces an appearance called hypopyon or unguis.\* Hypopyon is also produced by

\* Plate 4, fig. 1.



suppurative inflammation of the membrane of the aqueous humour; in which case there is no circumscribed opaque spot on the cornea. The term *Onyx*, then, is applied to the opaque inflamed spot which incloses an abscess of the cornea; and the term *Unguis* or *Hypopyon* to a collection of matter in the anterior chamber.

**TREATMENT.**—The treatment depends upon the state of the constitution, and the degree of vascular excitement in the part. If the patient is of a full plethoric habit, the conjunctiva and sclerotic are reddened by inflammation, and the cornea is rendered opaque by the same, it is proper to administer brisk aperients, and bleed both locally and generally in the first instance.

If, on the contrary, no very high degree of vascular excitement has been set up, and the opacity of the cornea is partial, or confined to the immediate neighbourhood of the abscess, local bleeding and counter-irritation will be sufficient. If the abscess is chronic, alterative doses of mercurials, diaphoretics, tonic medicines, and generous diet, should be prescribed; counter-irritants are in most cases beneficial.

Avoid the use of mercury in excess. If the system becomes affected by mercury, the disease frequently spreads with rapidity, and destroys the whole cornea. In this structure, as elsewhere, you will always find suppurative and ulcerative inflammation aggravated by ptyalism.

I have occasionally opened the anterior chamber,

and evacuated the matter of hypopyon through the lower part of the cornea with good effect. A simple puncture of small size answers best; for if the opening be not very small, prolapsus of the iris will ensue: this operation is rarely required,—indeed only when other means have failed.

Abscess of the cornea may usually be cured by local bleeding, counter-irritation, alteratives, and tonics. General depletion is only necessary when diffused inflammation of the other tunics is present; stimulants must be avoided, and collyria are worse than useless.

NOTE.—Two circumstances with respect to this subject, not alluded to above, are worthy of notice. The first is, that whenever a collection of matter forms between the layers of the cornea, there is always produced an ulcer upon the corresponding portion of the surface; the second, that notwithstanding this overture from without, the abscess, in apparent opposition to analogy, habitually discharges itself internally. The regularity with which a hypopyon thus formed disappears under the influence of medicine, contributes to afford solution to a much debated question; namely, whether pus once effused is ever reabsorbed? It may be denied that the matter of hypopyon is true pus, in those cases which undergo cure without operation; and the surgeon must admit the fact, that microscopical demonstration of pus globules is in such cases, from their very nature, precluded. Still, as in the history and circumstances of its production, no less than in all its appreciable characters, this matter often agrees completely with the product of a common abscess, the objection appears to possess little weight.

Operative interference should always be refrained from, unless the case imperatively demands it; but progressive augmentation of the morbid effusion, unchecked by treatment, so as to

reach the level of the pupil, with continued maintenance of inflammation of the part, and of severe hemicranial and local pain, unrelieved by cupping, anodynes, and other measures enjoined in the text, indicates the necessity of puncturing the cornea. When thus urgently called for, the operation should be performed with the point of a cataract knife; and a low situation in the cornea should be selected, to facilitate the discharge of the morbid effusion, to diminish the danger of wounding the iris, (which is, of course, lessened by the introduction of the instrument nearly in the same plane with, instead of at right angles to, that membrane), and to prevent a subsequent cicatrix in the axis of vision. After evacuation of the anterior chamber in this way, belladonna must be applied for the same purpose as after perforation from ulcer.



## STAPHYLOMA OF THE CORNEA.

**DESCRIPTION AND HISTORY.**—Staphyloma is an abnormal opaque projection of the cornea, usually produced by ulceration, and always attended during its formation with a considerable degree of inflammatory action. Staphyloma is of two kinds: one form is produced by a morbid condition of the cornea only; while in the other, the iris also enters into the composition of the tumour. They arise in the following way:—the cornea having become thinned and weakened by ulceration, yields to the pressure of the contents of the globe, and bulges forwards; adhesive inflammation is set up in the part, and fibrin is poured out and organized.

By the deposition and organization of this new matter the ulcerated tunic is strengthened and partially repaired, and increase of the tumour is prevented.

We find analogy for this process in the thickening of a hernial sac, or of the walls of an aneurismal cavity; and even in the formation of the investments of a common phlegmonous abscess. In hernia, aneurism, abscess, and staphyloma, alike, we find pressure upon a weakened part counteracted by deposition and organization of new matter.

Now, when an extensive ulcer penetrates completely through the cornea, and the aqueous humour escapes,

the iris prolapses, and, lying in contact with the posterior surface of the cornea, is kept in that situation by the contents of the globe pressing from behind. Meanwhile, the iris becoming inflamed, throws out a layer of lymph on its anterior surface ; and so, adhesive inflammation of the cornea on one hand, and of the iris on the other, with the circumstance of their being placed in close apposition, occasions permanent union by adhesion between the two. The iris being thus glued to the cornea is pushed forwards together with that coat, and consequently forms a part of the staphylomatous tumour.

If, however, there is no ulcerated aperture through the cornea, the latter alone bulges forwards ; and the iris retains, to a certain extent, its natural position.

These, then, are the two kinds of staphyloma : the one being composed solely of a morbid dilatation and opacity of the cornea ; the other including a bulging and adherent iris likewise. The former is of a pearly white colour ; the latter of a grey or bluish hue.\*

TREATMENT.—The treatment of Staphyloma simply consists in the entire removal of the tumour. The results of the operation in the two forms of the disease are as follows :—When the iris is involved, the globe collapses, from escape of the humours, upon the removal of that membrane : when the cornea only is concerned, the iris remains entire ; and the globe, to a limited extent,

\* Plate 4, fig. 2.

preserves its globular figure. The operation is painful, and occasionally followed by acute inflammation : it is then necessary to deplete, to prevent abscess of the remaining portion of the globe ; and tepid fomentations and local depletion will, in most cases, be required.

The recumbent posture is not necessary during the after treatment ; but pressure on the part must be carefully avoided.

NOTE.—The excision of a staphyloma is only called for, either by the natural desire to be relieved of a great deformity, or in consequence of the continual irritation kept up on the surface of the eye by the presence of the tumour ; restoration of vision is out of the question. An artificial eye may be adapted after the immediate consequences of the operation have passed away ; and the patient may thus resume, to a great extent, his former comeliness.

When liberation from the annoyance of perpetually recurring inflammation is the only object contemplated, this may sometimes be effected, without operation, by the repeated application of lunar caustic to the surface, around the base of the projection. By this stimulus to the weakened part, so material a diminution is occasionally produced in the size of a staphyloma as to render the severe operation of removal needless. It is scarcely requisite to add, that no slough must be caused ; but that the nitrate of silver should be at once lightly and rapidly applied.



## CONICAL CORNEA.

THE cornea, from preternatural increase in size, will occasionally assume a conical form, and project considerably beyond its natural level. Conical cornea is hardly to be called a disease; for it is not the effect of inflammatory or any other appreciable morbid action; it occurs in the middle periods of life, in the robust and healthy as well as the cachetic, and it leaves the transparency of the membrane perfect. We are entirely unacquainted with the cause of the complaint; and, equally so, with any plan of treatment productive of benefit to the patient. The diagnosis is extremely easy: the prominence is of course seen immediately, by taking a side view of the eye; and though, in front, the projection is not observed, an extraordinary brilliancy is apparent, owing to the peculiar reflection of light from the cone. An individual the subject of this affection is always near-sighted, or unable to distinguish distant objects.

This disorder, after having been developed to a certain extent, will sometimes remain stationary for the rest of life, and produce little inconvenience. In other cases the projection acquires an enormous size; and the apex of the cone becoming irritated by the friction of the lids inflames, and an opaque spot in the axis of vision is the consequence; generally, however, a conical cornea remains transparent.

We know nothing of the pathology of this affection,

we know nothing of its treatment ; and, therefore, I need not occupy your time by dwelling on the subject.

NOTE.—The impairment of vision attendant upon the state of conical cornea, which sometimes amounts to virtual blindness, is an effect of the increased refractive power necessarily arising from the morbid convexity. Hence the focal images of external objects (the product of luminous rays, which, by due refraction as they traverse the several transparent media in a healthy eye, are collected precisely at the retina) fall far short of their normal destination ; and their component rays, again dispersing, serve but to excite upon the nervous tunic impressions confused and indefinite, in proportion to the degree of aberration of the cornea from the proper form.

It might be supposed that a concave lens would remedy the defect ; but such is not found in practice to be the case. Again, it was hoped that extraction of the crystalline, as being one of the principal refracting agents of the eye, might afford compensation for the morbidly augmented power of another. This ingenious plan, devised by the late Sir W. Adams, was carried out by him on more than one occasion ; but the success resulting from the measure was not sufficient to earn for it permanent recognition. Lastly, it was proposed by Mr. Tyrrell to withdraw the pupil by means of a blunt hook introduced through a puncture of the cornea, from beneath the most prominent part of that tunic ; and thus to evade the disease. This operation yet awaits the test of general experience ; but, from the high professional character of its advocate, possesses strong claims to careful trial.

Beyond those remedies which tend to promote the tone and healthy development of the system, and perhaps mild local stimulants, medicine yields no resources which are effective in combating this curious affection.

## PROLAPSUS IRIDIS.

HISTORY AND APPEARANCES.—I have already mentioned that in consequence of the evacuation of the aqueous humour through an aperture in the cornea, the Iris is apt to protrude, and form what is called Prolapsus Iridis; I have not, however, described the exact appearance or the treatment of this affection, and shall now, therefore, take the opportunity of doing so.

Prolapse of the Iris may be either complete or partial. Complete prolapse occurs after sloughing of nearly the whole transparent cornea from purulent ophthalmia, variola, &c. Partial prolapse takes place through a small aperture from wound or ulceration. In the former the iris is pushed forwards into the situation of the destroyed cornea, and presents the appearance of an irregular tuberculated mass. In course of time, as inflammation subsides, the projecting iris shrinks; and the remaining ring of cornea attached to the sclerotic granulates and cicatrises over it. Thus, when perfectly healed, the eye exhibits a cicatrix in lieu of the transparent cornea: the circumference of the cicatrix is white and opaque, the centre dark; for the iris is glued to its posterior surface. Complete prolapsus iridis, being caused by a slough of nearly



the whole cornea, is always attended with entire loss of vision.

Partial prolapsus frequently exists without any inconvenience as regards the sense of sight. It is by no means a rare consequence of active inflammation in the cornea; and appears first in the form of a small brownish, semi-transparent, rounded projection on the surface of that structure. The margin of the aperture, through which the iris is thrust, appears hazy from inflammation\*; and the protruding portion of membrane soon becomes glued thereto; and so remains permanently attached for the rest of life.

The projecting tumour gradually disappears; a cicatrix closes over it; and its former situation is indicated in after life by a dark blue or black spot upon the cornea surrounded by an opaque white zone.

TREATMENT. — In the treatment of Prolapse of the Iris you must be guided by the appearance of inflammation in the neighbourhood. Thus, as it is often produced by acute ulcerative inflammation of the cornea, an antiphlogistic plan of treatment is frequently necessary. Wounds of the cornea also, which give rise to this complaint, generally require depletion, for the purpose of lessening the inflammatory action consequent upon them. The whole treatment, then, of prolapsed iris, consists in lessening irritation and inflammation in surrounding parts; the surgeon waiting

\* Plate 2, fig. 3.

for the gradual subsidence of the tumour by a natural process. If the prolapse is small, its reduction may be hastened by the free application of nitrate of silver; if large, great care must be observed in the application of this remedy, and a small portion of iris only should be touched at once; for if a large surface be painted with caustic, severe inflammation will now and then follow.

The consequences of prolapse of the iris depend upon the size and situation of the aperture in the cornea through which the membrane has protruded. If the point of protrusion be situated in the axis of vision, the opaque spot left after the cornea has healed will of course interfere with the passage of light to the retina; and the organ will be proportionately damaged. If, again, the aperture in the cornea be of large size, the pupillary margin of the iris is sometimes thrust through the gap, or adheres to the sides of the opening: in these cases, the pupil being obliterated, and the light completely prevented from reaching the retina, an operation for artificial pupil is required. But if the aperture be small, and nearer the circumference than the centre of the cornea, sight is in no way affected by permanent prolapse: irregularity of the pupil does not interfere with the healthy functions of the eye; indeed, in some persons the pupil is naturally irregular.

NOTE.—In the treatment of Prolapsus Iridis from loss of substance of the cornea, the prompt and continued use of belladonna, for reasons stated in a previous note, should never be omitted.

## INFLAMMATION OF THE IRIS.

INFLAMMATION of the iris may arise from various exciting causes : sometimes it occurs from continued inflammation in its vicinity ; sometimes as an original disease. Iritis may be divided into three kinds : 1st, common or Idiopathic ; 2d, Syphilitic ; 3d, Arthritic.

### COMMON IRITIS.

SYMPTOMS AND HISTORY.—Various causes may produce this disease ; as mechanical injuries inflicted in operations or from accident, over-exertion of the eye, or exposure to excessive light ; sympathy between the retina and iris in the last mentioned cases exciting the morbid action. Hence, in persons occupied in close and continued inspection of minute objects, Iritis is occasionally met with.

The first symptoms are, pain in the globe and orbit, increased by the motions of the former, and intolerance of light ; febrile excitement not being present, unless in very acute cases. The first visible indication of the existence of inflammation in the iris is loss of its natural brilliancy, apparent by comparison with the sound eye. The pupil is more contracted than that on the opposite side ; and in all cases a faint zone of straight pink vessels, situated entirely in the sclerotic coat, encircles the circumference of the transparent cornea.



Iritis is an inflammation of the adhesive kind ; and accordingly lymph is poured out to a greater or less extent during its progress. The deposit of adhesive matter is at first entirely interstitial, and commences in the part of the iris around the pupillary margin. Here the first perceptible change is seen ; the delicate thin edge of the iris being thickened, and alternate contraction and dilatation of the pupil impeded. The pupil, then, is contracted, and the motions of the iris are imperfectly performed ; but while the effusion of lymph remains purely interstitial, we observe no change in the figure of the pupil.

The effect of the interstitial deposit of adhesive matter, however, is very soon observed over the whole surface of the iris ; and from this cause, not from any altered condition of the fluid circulating through its blood-vessels, a change next takes place in the colour of the affected membrane. The lymph effused in the interstices of the muscular fibres of the iris is yellow ; the colour of the part which results under inflammatory action of course varies with its colour in health.

As the effusion takes place first in the inner circle of the iris around its pupillary margin, the change of colour commences there also, and thence extends over the entire surface.\*

It occasionally happens that in the same individual the irides are naturally of different colours ; one perhaps blue, the other green. Sometimes the same iris is half

\* Plate 6, fig. 2.

green and half blue ; in which case no mistake can occur, as this appearance is never produced by inflammation. But in those who possess irides of different colours, common acute inflammation of the conjunctiva might possibly be mistaken for pure iritis ; as, in both, intolerance of light and pain would co-exist with an altered colour of the iris. Conjunctival inflammation is frequently combined with iritis, and the pink zone of sclerotic vessels is then obscured or concealed beneath the tortuous vessels of the conjunctiva ; so that an injected and vascular conjunctiva and a discoloured iris are diagnostic marks of the complaint. If, under such circumstances, doubt should ever arise, you will at once be able to determine whether the discolouration of the iris be the consequence of inflammation or not, by the condition of the pupil, and the comparative brilliancy of the membrane. The colour may deceive you, the appearance of increased vascularity may lead you into error ; but loss of brilliancy of the iris, and inactivity, contraction, or irregularity of the pupil, are marks of distinction characteristic of iritis and of iritis only.

To proceed with the symptoms of Idiopathic Iritis : the effusion of lymph produced by inflammation of the iris, is, as the disease advances, not only poured between the muscular fibres, but also deposited upon the surface, principally the posterior. You are aware that the pupillary edge of the iris is extremely close to the capsule of the crystalline lens ; the two being separated, however, by the posterior chamber. Now, when the former is thickened by interstitial effusion, and deposition of adhe-

sive matter takes place upon its surface, and the pupil is contracted, these parts are brought into absolute contact. In consequence of this, they are soon glued together by adhesion, sometimes along the whole circumference of the pupil: more generally the adhesion is partial, a small portion only of the margin of the iris being attached to the capsule of the lens.

When this is the case, one part being fixed and the rest moveable, of course the pupil no longer retains its circular figure, but becomes irregular; and this change is a common consequence of iritis.

Deposition of adhesive matter next takes place in distinct patches upon the iris,\* and sometimes blood is poured into the anterior chamber. The situations in which this fibrinous deposit is seen are various; the pupillary margin, the ciliary edge, or nearly the whole anterior surface of the membrane, may be covered by lymph; and it occasionally also spreads over the capsule of the lens. This deposit on the capsule is principally supplied by the pupillary margin of the iris; and when it collects in any considerable quantity, the rays of light being completely prevented thereby from passing to the retina, temporary blindness is produced.

In other organs, which, like the iris, assume at first the adhesive form of inflammation, if a quantity of lymph is poured forth disproportioned to the powers of organization or absorption, it acts as an extraneous body, and a second process is required for its removal. Thus, in common abscess, adhesive inflammation pro-

\* Plate 6, fig. 3.



duces induration beneath the integuments by the effusion of lymph ; and the absorbent vessels (the scavengers of the system) being incapable of removing this, it is expelled through an external outlet by the ulcerative and suppurative processes. In like manner, when the quantity of lymph thrown out upon an inflamed iris is disproportioned to the absorbing or organizing powers of the part, the formation of an abscess is the result, and such abscess invariably bursts into the anterior chamber. The pus thus poured forth falls to the bottom of the chamber between the cornea and iris, and in this way hypopyon is occasionally produced as a consequence of iritis. Incipient hypopyon is shown in the diagram to which I have just referred.

While these changes are going on, the pain, which is at first of a dull and heavy kind, becomes acute and lancinating. It is seldom continued, and is comparatively inconsiderable during the day ; but nocturnal exacerbations of suffering are generally complained of in cases of iritis.

When the disease is confined to the iris, the vascularity of the conjunctiva is not great. But it frequently happens that every tunic of the eye becomes affected ; and the more prominent diagnostic symptoms are then obscured. You cannot distinctly see the zone of sclerotic vessels, in consequence of conjunctival injection ; you cannot distinguish the iris, owing to haziness of the cornea ; so that it is often difficult at length to determine in which tunic the disease first commenced.

In very severe cases the whole of the pupillary margin of the iris becomes glued to the capsule of the lens, and thus the communication between the anterior and posterior chambers of the aqueous humour is cut off. The iris thereupon, not unusually, bulges forwards, from the pressure of the aqueous humour in the posterior chamber. A larger portion of aqueous humour seems to be secreted from the posterior than from the anterior chamber of the eye, under such circumstances; and consequently, when the communication between the two chambers is closed, the more abundant secretion behind necessarily pushes the iris towards the cornea.

I do not mean to assert that in the healthy state a greater quantity of aqueous humour is secreted in the posterior than in the anterior chamber; but I think that this is always the case when, after perfect adhesion of the pupil, the iris is thrust forwards; for there appears no other way of explaining the phenomenon.

If idiopathic iritis continue unchecked by proper remedies, the inflammatory action will extend to the retina, the choroid, and the cornea; and, from the change which long uncontrolled inflammation always produces in these textures, will cause total disorganization of the eye. The cornea then becomes permanently opaque; the pupil either closed, or nearly so; the capsule of the lens, coated by organized adhesive matter, loses its transparency; and the retina is partially or entirely disintegrated. In all such cases, the colour of the iris is completely altered, and the membrane presents a dull opaque appearance.

## SYPHILITIC IRITIS.

A MODIFICATION of Iritis frequently occurs from inoculation of a syphilitic poison, and is, in fact, one of the most common forms of the complaint. As the means of remedy for common Idiopathic and for Syphilitic Iritis are nearly the same, I shall describe the appearances of the latter, before speaking of the treatment adapted for both.

HISTORY AND SYMPTOMS.—Syphilitic Iritis may be regarded as one of the genuine secondary symptoms of the venereal disease ; it usually occurs in conjunction with cutaneous eruptions, and very frequently with sore throat, but it must be considered as an occasional, not a constant product of syphilis. The same, however, may be observed of other venereal symptoms : we do not, for instance, find that an eruption on the skin, or an ulcer in the throat, invariably follows the inoculation of a syphilitic poison, or the formation of a primary ulcer. The system, in some individuals, is not susceptible of receiving those impressions from the action of the poison which lead to the production of secondary symptoms. Consequently, the skin, the throat, and the iris, remain unaffected. I have never, however, seen Syphilitic Iritis where mercury has not been previously given, and I therefore consider it a compound disorder.

Now, Syphilis, as it affects the skin, the throat, and the genitals, presents to our observation a train of morbid phenomena as various in their appearance as they are distinct in their origin. A primary sore may



appear in the form of an excoriation, or of a phagedenic, a tubercular, a gangrenous, or a sloughing ulcer ; the fauces may be affected, either by superficial ulceration, or by foul and phagedenic disease ; and we see the effect of the poison upon the skin, in the varieties of papular, pustular, vesicular, squamous, and tubercular eruptions. But Syphilis, as it affects the organ of vision, is not subject to these modifications, but presents precisely the same appearance under all circumstances ; for whether Syphilitic Iritis accompanies the papular or the squamous eruption or the elevated scab of rupia prominens, or occurs uncombined with any cutaneous affection whatever, the appearances are uniform.

As in common iritis, the first symptoms are pain and intolerance of light,—the former generally increased at night, and comparatively absent during the day ; thickening of the inner margin of the iris ; and contraction of the pupil, which is commonly drawn upwards and towards the inner canthus. The conjunctiva is usually unaffected, but the zone of sclerotic vessels around the cornea always exists from the commencement of the disease. The colour of this zone in Syphilitic Iritis is highly characteristic ; it is not pink, but like cinnamon, rusty brown-red ; a circumstance which constitutes a good diagnostic mark between common and Syphilitic Iritis.

Adhesions are formed at a very early period between the iris and the capsule of the lens ; and patches of lymph are soon deposited on the anterior surface of the iris. The adhesive matter thus poured out is sometimes of a reddish hue, and its effusion takes place

more rapidly and abundantly than in common iritis, so that the adhesions of the pupil are more extensive.

These are the only visible marks of distinction that I know between Syphilitic and common Iritis. I may add, that nocturnal aggravation of pain in the globe and orbit is much more frequently met with in the Syphilitic, than in any other form of the disease. Perhaps, however, the best diagnostic symptoms are those afforded by the existence of a venereal poison in the system. Venereal sore throat and eruptions are never accompanied by pure idiopathic iritis; for whenever the system is affected by a venereal poison, inflammation of the iris is characterized by the dusky red cinnamon zone, and the effusion of adhesive matter.

Syphilitic Iritis most frequently occurs in combination with the papular eruption; and more frequently with the squamous, than with the pustular or vesicular. If uncontrolled, it inevitably terminates in entire destruction of the organ, in the same manner as common iritis; namely, by closure of the pupil from contraction of its fibres and organization of adhesive matter, and disintegration of the retina from continuous inflammation.

If seen in the commencement, however, venereal iritis is always under the control of remedies, and may be cut short before the choroid and retina are permanently damaged by inflammation. This cannot be said of common iritis, in which there is greater disposition to acute inflammation of the deep-seated tunics.

TREATMENT OF COMMON AND OF SYPHILITIC IRITIS.—  
The remedies in both species of iritis are extremely



simple ; yet we have not in the whole range of surgery a more satisfactory example of the influence of medical treatment over morbid action.

If the complaint is in an acute form, the pain is excessive, intolerance of light extreme, and the patient not reduced to a state of utter prostration by previous disease, or other cause of debility, you should in all cases extract blood from the arm. Do not wait for a sharp accelerated pulse, and febrile excitement ; accession of extreme pain and intolerance of light, effusion of lymph, and contraction of the pupil, render it necessary to lower the powers of the system by general depletion, although the pulse may not be above the natural standard. The quantity of blood to be taken depends upon the constitution of the patient, and the degree of pain and vascularity : in a robust plethoric subject it may be necessary to bleed to syncope. Sometimes, however, general blood-letting is contraindicated by constitutional debility ; and we must then have recourse to local abstraction of blood by cupping.

These are preliminary steps to the free use of a remedy which in most cases proves infallible. That remedy is mercury, without which, bleeding, purging, and local depletion, are unavailing ; and in cases of acute iritis, in almost all constitutions, it must be your sheet anchor.

In acute inflammation of other parts the powerful operation of this active medicine upon the capillary system must be well known to you ; but in no disease are its effects more strikingly shown, and in none is its exhibition more imperiously called for, than in acute



inflammation of the iris. Seeing the evidences of acute inflammation in the extremely vascular sclerotic, in the dull and discoloured iris, the anterior chamber loaded with adhesive matter, and the disfigured pupil,—you may purge, and deplete to the utmost without saving the organ : but directly you affect the system with mercury, an immediate change is produced ; the vascular zone round the cornea fades away, the adhesive deposit is absorbed, the iris regains its natural brilliancy and colour, and generally in a very short space of time every appearance of morbid action vanishes.

Now, although the effect of mercury in iritis is nearly always sure and expeditious, in many, particularly syphilitic cases, while using mercury to cure one malady, we are producing or aggravating another. For iritis frequently occurs in patients who are the subjects of disease of bone, or of aggravated rupia, and have been saturated with mercury. This medicine is always injurious to the constitution under such circumstances ; but, at the same time, in withholding it we should be incurring consequences infinitely worse ; for loss of sight would then be inevitable. With such an alternative, we must forget disease of less important organs, to preserve entire the most valuable gift with which nature has furnished us. When called, therefore, to a case of acute iritis, (a disease which, if not arrested, is sure soon to involve other structures—the choroid and retina—in which its effects are beyond the reach of our remedies,) having used that amount of depletion which the system

will safely bear, we must hasten to produce a powerful impression by repeated doses of mercury. Calomel, combined with opium, is perhaps the best form in which mercury can be administered, and it will be necessary at first to give somewhat large doses; but as soon as foetor and redness of the gums are produced, smaller doses will suffice. The system must be kept under the influence of mercury until the effused adhesive matter is absorbed, and the natural condition of the iris restored; but salivation is not necessary for the cure of this, nor of any disease. The injurious effects, which the remedy may have produced on the constitution, may afterwards be counteracted by other treatment.

Blisters must be avoided at first, when the disease is in its acute form, but may be applied during the progress of cure. Apply belladonna to the palpebræ, or use it in a collyrium, to dilate the pupil and prevent adhesion to the capsule. The more widely the pupil is dilated, the farther is its edge removed from the convex anterior surface of that structure. If this precaution is not taken, the pupillary aperture may be rendered irregular, or be quite closed by the effusion of lymph. The eye should be shaded, lest the stimulus of light upon an irritable retina should increase the inflammation which already exists.

Your prognosis may be favourable if the disease is confined to the iris. But if you find acute inflammation of other textures, intense redness of the sclerotic, extreme pain, insensibility to light, a puckered and deadened appearance in the iris, and closure of the pupil either by contraction and adhesion or by deposit



of adhesive matter, an unfavourable prognosis must be given, for under such circumstances blindness will almost invariably ensue.

NOTE.—That there is a certain definite form of inflammation of the iris, which, when met with, is characteristic of the presence of a venereal poison in the system, must be regarded as an ascertained truth ; but to assert that every iritis occurring in the subject of syphilis must necessarily assume the insignia of this peculiar form, would be to controvert daily experience. The co-existence of rheumatism in the system, and various other causes, may and do modify the appearance of iritis arising under these circumstances. And it is very essential that the fact should be fully understood, that, while, in some cases, the surgeon can confidently determine from the aspect of the inflamed eye that the patient is syphilitic ; in others, it is only from independent knowledge of the latter point, that he is enabled to trace the iritis with certainty to its true origin. Well-marked cases of syphilitic iritis owe their peculiar characters to the circumstance, that it is the venereal poison alone which habitually sets on foot *phlegmonous* inflammation of the iris—inflammation, that is, of an active but circumscribed kind,—iritis parenchymatosa, as it has been termed. This fact affords a key to all the peculiarities of the well-developed syphilitic disease. The thickening of the iris,—the tubercles which sprout from its surface,—their cinnamon colour, caused by the ramification of enlarged blood-vessels over them,—the slender adhesive bands which are left, sometimes like the spokes of a wheel converging from the edge of the iris, wherever a tubercle had formed, to the capsule of the lens,—these all are due to the circumscribed, interstitial, adhesive character of the inflammation ; and constitute indices of its nature, which, when present, may securely be relied upon.

Having entered fully into this subject in another place (Guy's Hospital Reports, October 1844), the Editor re-



frains from enlarging upon it here. He feels called upon, however, to give his opinion, the result of an extensive experience, that, in the treatment of this disease, general blood-letting is very rarely demanded, or even admissible; and that the withdrawal of from six to twelve ounces of blood from the temple by the cupping glass (the application of which may, *if necessary*, be renewed) will almost invariably suffice. Hale, robust subjects of this distemper, may be benefited by venæsection; but such cases are quite exceptional.

It is an extremely important point with respect to the employment of blisters in iritis, never to allow their application near the inflamed organ. After the violence of the disease has been subdued by local depletion and mercury, blistering behind the ear is of great service; but the temple is a situation of too great proximity: and neglect of the above precaution, by substituting direct for counter irritation, is apt to convert a most useful curative into a seriously injurious agent; for, of blisters, as of every remedy, the virtue entirely depends on appropriate use,—*φίλη μὲν ψάμμος, ἀλλ' οὐκ ἐν ὀφθαλμοῖς.*

Internally, the iodide of potassium, in three or four grain doses, with the extract and decoction of sarsaparilla, is very beneficial, as soon as acute inflammation has yielded: and it is often necessary to continue small alterative doses of mercury for a long time after inflammation has disappeared, in order to remedy some slight amaurotic symptom, resulting probably from the choroid having partaken in diseased action. Belladonna extract is more advantageously used in substance around the orbit, than as a collyrium, in this complaint; and perseverance with it, during convalescence, for some weeks after the malady has succumbed to treatment, will not unfrequently be rewarded by entire liberation of the pupil from attachment to the capsule of the crystalline. A severe syphilitic iritis, however, seldom fails to leave indelible traces of its previous existence in more or less extensive permanent adhesions: these are generally comparatively narrow bands, exhibiting a brown colour, and not interfering much with the exercise of perfect vision.

## ARTHRITIC IRITIS.

I HAVE told you that the iris is subject to three distinct kinds of inflammation, viz. common or idiopathic, syphilitic, and arthritic or rheumatic.

Having described the two former, it remains for me to conclude the subject of Diseases of the Iris by describing the symptoms and treatment of Arthritic Iritis.

HISTORY AND SYMPTOMS.—Rheumatic inflammation differs from every other form of inflammatory action in the iris, in its cause, its consequences, and treatment.

The disease, as its name implies, is always produced by a transfer of that morbid action, which we recognize under the terms of gout or rheumatism, to the part; and therefore invariably occurs in those individuals who have been, or are at the time, the subjects of one of these complaints elsewhere. It appears generally to arise from metastasis; for we usually find it most severe during the absence of disorder in other parts; and frequently an attack of gout or rheumatism in the extremities will immediately suspend the inflammation of the iris. In some cases, however, on the other hand, a general development of rheumatic or gouty affection of the system accompanies the disease.

Arthritic Iritis is characterized by the following peculiarities:—The pain commences in the orbit, and not in the globe, as in common or syphilitic iritis; the motions of the eye are not attended with suffering, but an uneasy sensation is soon felt in it,

though it remains free from acute lancinating pain. The pain is referred to surrounding parts, is always severe, and recognized by the patient as being of a rheumatic kind. The zone round the transparent cornea, and a dull, deadened, discoloured appearance of the iris, are immediately produced. This appearance of the iris does not differ much from that which we observe in common iritis; but the zone always affords a diagnostic sign of the character of the inflammation; for it is neither bright pink nor cinnamon-brown, but dull, rusty red. Moreover, the form of the zone is peculiar. In other species of iritis the red sclerotic vessels reach as far as the margin of the cornea; in Arthritic Iritis an interval is left between the circumference of the cornea and the red zone which surrounds it. This space is of the natural colour of the sclerotic, a narrow whitish ring of which consequently intervenes between the transparent membrane and the zone of radiating vessels by which it is encircled.

A normal appearance occasionally met with is often mistaken for the morbid appearance I am describing. Rheumatic inflammation of the iris frequently occurs in old persons, in whom an annular portion of the circumference of the cornea is apt to become whitened and opaque; the narrow white circle thus produced being called *arcus senilis*. Now, when the iris becomes dark and dusky from inflammation, an *arcus senilis* is invariably rendered more distinct, in consequence of the increased contrast afforded by the deepened colour of the diseased iris in the back-ground.



Thus the arcus senilis being comparatively indistinct in the sound organ owing to the brilliancy of the iris, and at the same time prominently apparent in the other by reason of the altered condition of that membrane, the difference is striking ; and you might consider the appearances so presented as corresponding with the description of the white interspace left between the cornea and the sclerotic zone in Arthritic Iritis. You must, therefore, remember that the white circle, in cases of Arthritic Iritis, is in the sclerotic external to the margin of the cornea ; and that the white circle in the cornea is (for the reason I have mentioned) developed in every case of iritis occurring in the subjects of arcus senilis, whether that iritis be of a common or specific kind.

After the occurrence of pain in the orbit, discolouration of the iris, and the formation of a zone around the margin of the cornea, the pupil, which in the first instance contracts, forms adhesions to the capsule of the lens ; but it would appear that lymph is sparingly effused, and is confined principally to the posterior surface of the iris ; for, though the pupil be glued by adhesion to the capsule, we never as a rule observe patches of adhesive matter upon the anterior surface of the iris. This, then, is another diagnostic symptom from common or syphilitic iritis, that in Arthritic Iritis you find at first no effusion of lymph in patches upon the surface of the membrane. A permanently contracted state of the pupillary aperture not unfrequently takes place, in cases of Arthritic Iritis, even in the space of twenty-four

hours, without any adhesion of the iris to the capsule of the lens, but simply from a morbid interstitial change in the iris itself.

If the disease has been of long standing, and the patient has been the subject of repeated attacks, permanent opacity will be produced in the capsule of the lens, and in many cases in the lens itself. This opacity results from an altered condition of the capsule ; not from the effusion and organization of a distinct layer of lymph, as in other cases of iritis. Capsular and lenticular cataract, then, are not unfrequent effects of repeated and uncontrolled attacks of the disease I am describing.

There is generally intolerance of light (not, however, amounting to darting pain) in cases of Arthritic Iritis.

In speaking of the two other forms of iritis, I told you that if inflammation was extremely acute, and no remedies were applied, extension of inflammatory action to the adjoining deep-seated tunics would inevitably occasion complete disorganization of the retina, and perhaps of the entire globe. This is not the case in Arthritic Iritis, which, even if uncontrolled by proper remedies, will generally, after a certain time, spontaneously subside, and leave the organ nearly in its former condition. The iris will then to a certain extent regain its former brilliancy, and the retina resume its healthy functions. One part of the eye, however, will show traces of the previous morbid action,—I mean the pupillary aperture. It is from the effects upon the capsule and lens, noticed above, that Arthritic Iritis is pro-



ductive of permanently mischievous consequences ; for after each attack, the pupil becomes more contracted, and the capsule and lens more opaque, until at length the rays of light are completely excluded from the retina, and sight consequently is destroyed.

The influence of the disease, then, upon the pupillary aperture and capsule affords the principal ground for apprehension ; closure of that aperture, and opacity of the capsule and lens, being almost always the results of repeated attacks of the complaint, while a single attack is very rarely attended by destruction of vision. It is, I say again, from numerous neglected or improperly treated attacks that the disease occasions blindness ; but the application of proper remedies will in almost every case so far control the disease as to prevent the permanent changes I have described.

TREATMENT.—I have told you that in common and in syphilitic iritis the exhibition of mercury is absolutely necessary. In the pure rheumatic disease, however, this medicine is hardly ever required, and sometimes ptyalism will aggravate the complaint. Again, the treatment adapted for Arthritic Iritis is perfectly inert both in common and syphilitic inflammation. It is, therefore, very material that the distinction between these forms of disease should be well known, since the remedy for one might prove a cause of further excitement to the other. General and active antiphlogistic measures are hardly ever required in Arthritic Iritis : if, however, there be extremely severe pain, and febrile excitement, it may be necessary to abstract blood from the arm ;



but cupping on the temple and free application of leeches generally prove sufficient. Blisters are highly useful; and when intolerance of light is great, a green shade or veil is of course necessary; tepid fomentations are preferable to the application of cold.

The medicines to be exhibited in the first instance are such as act freely upon the bowels, with the view of clearing the alimentary canal of its contents.

You should afterwards administer the remedies which are found beneficial in acute or chronic rheumatism in other parts. Thus, bark, which in some cases of rheumatism has been found useful, is an exceedingly good medicine in rheumatic iritis, particularly when combined with an alkali. The following is a useful formula for its exhibition :—

R. Pulv. Cinchon. gr. v.

Sodæ Carb. ʒj.

Fiat pulv. ter in die sumend.

In all cases, restore or insure a healthy state of the secretions by antimonials and small doses of mercury. The latter is to be used in this disease, not to affect the salivary system, but as an alterative to increase and improve the secretions generally. While taking these medicines, the patient should avoid all stimulants in diet, such as wine, malt liquor, and animal food.

Now it will occasionally happen, that a chronic form of inflammation remains after the more urgent symptoms have subsided, and in some few such instances it

may be necessary to affect the system with mercury ; but these are not pure cases of Arthritic Iritis ; they are cases in which common chronic inflammation supervenes upon that disease. The appearance of the eye partakes more of the character of common iritis ; the iris remains dull, the zone approaches the cornea, and there is pain in the globe.

In these mixed cases freer use of mercury may be necessary ; but in pure Arthritic Iritis it is only required as an alterative ; for, if in a remediable form, the disease will yield to the other remedies I have described.

NOTE.—Some of the peculiar phenomena of arthritic iritis are materially elucidated by accurate views of the pathology of the affection. Frequently combined with a larger share of sclerotic inflammation than is usual in the other forms of iritis, this disease is for the most part an inflammation of the serous investment of the iris, not of the parenchyma of that membrane. Hence the diffuse character of the inflammation ; the universal dulness and discolouration of the iris at an early period ; the absence of patches of lymph, and of circumscribed swellings ; and hence the quick cohesion of the iris with the adjacent capsule by means of broad bands, and oftentimes by uninterrupted circles of false membrane, which encroach more or less upon the area of a pupil irretrievably adherent. By bearing in mind the pathological rationale of the differing symptoms of syphilitic and of arthritic iritis, the morbid appearances of the two diseases will be more readily, because more clearly, understood and remembered.

In the treatment of arthritic iritis, after the employment of cupping, and of some brisk purge as a powder of calomel and jalap, a very useful form of medicine, when general power is not very defective, previously to exhibiting bark, is a draught

consisting of a drachm of sulphate, and ten grains of carbonate of magnesia, with twenty or thirty minims of colchicum wine in mint water, to be given thrice daily. At the same time five grains of the compound calomel pill should be given at least every night. The bowels being thus freely acted upon as directed in the text, and the violence of inflammation being thereby somewhat abated, the case will be better prepared to derive benefit from bark ; and the dose of mercury may then with perfect safety be diminished to a mere alterative. The caution respecting blisters in iritis, given in the preceding note, fully applies to the arthritic variety of the disorder ; and throughout the course of treatment the sedulous use of belladonna is of the utmost importance, though, occasionally, subjects of arthritic iritis complain of augmented pain after its application, which is therefore obliged to be abandoned.



## SCLEROTITIS.

SYMPTOMS AND HISTORY.—It rarely happens that the sclerotic is alone the seat of disease, the cornea, iris, and choroid, being unaffected; and in most, if not all cases, where sclerotic inflammation is an original disease, the patient is under the influence of syphilis, mercury, or rheumatism, and often of all three.

Sclerotitis is in fact most frequently met with in individuals who are the subjects of mercurial rheumatism, and have previously been contaminated by a venereal poison. If the term pseudo-syphilitic be admissible at all, it is adapted to such a disease as the one I am now describing; which, for want of a better term, may therefore be considered a pseudo-syphilitic complaint.

The symptoms in the commencement are as follows :—

Intolerance of light, and obtuse pain in the eyeball increased by the motions of the globe. Febrile excitement is not a character of the disease; nor is the system, in the first instance, necessarily affected by the inflammatory action set up in the sclerotic; but as sclerotitis occurs commonly in cachectic individuals, constitutional derangement is consequently then present, as the effect of a previous exciting cause, though not from sympathy with the inflamed sclerotic.

The local indications of sclerotic inflammation consist in the appearance, at first, of a pink zone around the cornea; the whole tunic becoming changed in

colour in a short time, by the injection of its vessels with red blood.\* Contraction of the pupil next ensues, even before any manifestation of disease in the iris. Intolerance of light is invariably present, and more or less contraction of the pupil is always combined with that symptom ; but when symptomatic of this affection, the contraction is generally active.

These, then, are the local indications of the first stage of pure sclerotic inflammation. After a time the iris becomes inflamed, and it is then difficult to determine in which of the two structures the disease commenced. But if the case be seen at the beginning, you will be able to determine by the symptoms just described. The first figure of plate 7 illustrates diffused scleratitis ; the second shows the appearance of corneitis and iritis, in which the diffused blush over the sclerotic is wanting, a zone, however, being distinctly marked ; the third exhibits chronic scleratitis.

TREATMENT.—Inflammation of the sclerotic is not generally active, the accompanying conjunctival inflammation is comparatively trivial, and the subject of the disease, nine times out of ten, is cachectic or mercurialized. At the same time, though scleratitis assumes a chronic character, yet the nature of the affected part renders any continuance of morbid action highly dangerous to the safety of the organ. We are therefore called upon to use the most prompt means of checking the disease at the outset, lest by slowly

\* Plate 7, fig. 1.

increased vascular action the functions of the retina should become permanently impaired or destroyed.

Now in this disease, as in all inflammatory affections of the deep-seated tunics of the eye, local depletion is almost useless. When the sclerotic, the choroid, the iris, or the retina, become inflamed, general depletion is required. In the first place, then, abstract blood from the arm, in quantity proportioned to the age and constitution of the patient, and the degree of vascular excitement in the part. If general and active depletion is forbidden by debility, the organ assuredly will be damaged to a greater or less extent ; for it is by general depletion alone, that you can hope to preserve an eye the subject of severe and acute sclerotic inflammation. Cupping is far the best mode of abstracting blood locally in these cases, because it draws blood quickly ; and the greater part taken from the temple is arterial. Bleeding from an artery produces a more powerful effect upon the system than bleeding from a vein ; hence, by cupping on the temple, we deplete, to a very limited extent, generally ; and in some cases we are compelled to depend entirely upon this mode of abstracting blood.

It is necessary to act freely upon the bowels by purgatives ; and, if by such means you are unable to control the disease, it is proper to depress the powers of the system by continued nausea.

If your patient is saturated with mercury, there can be no doubt that the excessive and injudicious use of that medicine is the exciting cause of the complaint ; and under such circumstances, I need hardly say, such abuse



is to be discontinued. Yet, notwithstanding this, you must trust principally to the exhibition of mercury for a permanent and perfect cure.

The excessive use of mercury induces and aggravates the disease ; the moderate use of it is beneficial. If the patient is debilitated and irritable, administer opiates, and combine them with a diaphoretic, to prevent the known effects of opium upon the different secretions. Farther, endeavour to allay irritability by the liberal exhibition of sarsaparilla, for there is little or no good in giving small doses. Should the patient be under the influence of mercury, you may combine with sarsaparilla a small quantity of one of the mineral acids, as the nitric or sulphuric ; the tonic and alterative effects of which, in cachexia from ptyalism, must be known to you. Still, in severe cases of sclerotitis, where the iris and cornea have become involved, mercury given as an alterative is your sheet anchor.

When we give mercury in ophthalmic or other diseases to affect the system, we are too much in the habit of estimating the extent of its operation by the presence of mercurial foetor in the breath, inflamed and spongy gums, or profuse salivary secretion, and to persevere with the remedy until one of these three signs of its action is manifested.

It is true that these are proofs of its specific operation upon the body ; but it is equally true that the system may be affected without any of them being observable ; and consequently, that a powerful influence upon disease may be produced without salivation.

In many venereal affections which would yield to the

sparing and judicious use of mercury, ptyalism will increase the disorder ; and so it is with inflammation of the sclerotic. We sometimes find scleratitis appear in its most severe form when the system is saturated with mercury, and disappear under remedies as ptyalism subsides ; yet in many cases the subsequent exhibition of mercury, in small doses, is absolutely necessary for the permanent cure.

While giving these smaller doses, you are to be guided by the following rules :—

If the disease is yielding, do not increase the quantity of mercury, although no red line is visible on the gums ; for the amendment is a sufficient proof that the system is affected.

If, on the other hand, although the gums are reddened, and salivation is commencing, the disease remains stationary, you must not push the remedy farther, in hope of controlling the morbid condition of the sclerotic by its means. The slightest indication of mercurial action upon the salivary organs proves that you have gone far enough. If you excite ptyalism, the original malady will be increased, and may lay the foundation of others of the most serious nature. Again, when the disorder is manifestly under the influence of treatment, never think of trying to produce inflamed gums, but give mercury as sparingly as possible.

After scleratitis is reduced to a chronic form, when a purple zone only is left,\* if the patient is no longer the

\* Plate 7, fig. 3.

subject of mercurial salivation, it is best to establish counter-irritation, and give tonics in diet and medicine, with occasional small doses of mercury combined with a mild purgative. Where there is much irritability and intolerance, which is rarely the case, an opiate, or some form of anodyne, may perhaps be required ; but collyria are generally useless. The eye and eyelids should, however, be frequently fomented with warm water, and a green shade should be worn.

These are the means to be adopted in cases of pseudo-syphilitic sclerotitis. In many instances it is necessary to suspend the use of mercury altogether during the cure, and after allowing the system to recover, again to have recourse to it. In highly irritable habits, where mercury is obviously producing injurious constitutional effects, we must trust to the exhibition of tonics,—as sarsaparilla,—with antimonials, opiates, and counter-irritants.

Sclerotitis is liable to recur in a chronic form, until the general health is perfectly restored ; indeed, in some cases, the patient is subject to a return of the complaint for months, and even years.

NOTE.—With respect to the treatment of sclerotitis, the reader is again reminded that the tolerance of general depletion by the public constitution seems of late years to have diminished ; and that in practice, therefore, some relaxation of the above injunctions upon this head has become necessary. Cupping may now, in the great mass of cases, be depended upon, as offering fully adequate means of depletion ; and small doses of bark, with soda, are sometimes, even at an early period, of especial service.



A little surprise may perhaps be excited in the minds of some, by observing the inflammatory injection, in cases pointed out as examples of sclerotitis, so much disposed to affect a mere zonular form. The sclerotic zone of iritis is readily intelligible ; for sympathetic irritation may well be supposed to diminish, in proportion as the immediate vicinity of the focus of inflammation is departed from : but the zonular injection of actual sclerotitis cannot be accounted for in the same way. A circumstance, however, which is apt to be lost sight of, at once explains the difficulty : it is this ; that, in point of fact, only an annular fillet of the sclerotic admits of inspection in the living eye. At two and a half, or three lines distance from the corneal margin, the most intense injection of the sclerotic must necessarily fade gradually from view, as the expansion of the tendons of the recti, gathering increased substance, interposes an opaque texture between the eye of the observer and the inflamed tunic. Hence it can only be when other structures partake in inflammatory action, and in consequence of their doing so, that the morbid vascular injection attending sclerotitis can be visibly extended over the entire anterior hemisphere of the globe.

## STAPHYLOMA OF THE SCLEROTIC, AND CHOROIDITIS.

THE Sclerotic, like the cornea, is subject to staphylomatous enlargements. Staphyloma of the Sclerotic may be caused by mechanical injury, or by general thinning of its coats from absorption, owing to the pressure of the parts beneath.

In Staphyloma following a wound, and produced by the bulging of the newly formed parts during the healing process, there appears a circumscribed blue semi-opaque tumour at the situation of the wound, the remaining sclerotic being perfectly healthy. In the other species of staphyloma, in which extensive and general thinning of the membrane takes place, the disease originates in morbid enlargement of the choroid coat from inflammation, or in hydrophthalmia.\*

Staphyloma produced by breach of the sclerotic is an incurable complaint; no medical treatment, application, or operation, can be of the slightest benefit. The same may be said of the other form of the disorder: it is frequently noticed as a symptom of amaurosis, and might, perhaps, be mistaken for fungoid disease.

In fungus, however, (so far developed as to resemble this condition of the sclerotic,) the colour is more of a dull leaden hue; the venous congestion and vascularity of the part are considerably greater, and the progress of

\* Plate 5, fig. 2.

the disease is more rapid. Staphyloma of the sclerotic arises, generally, as a consequence of choroiditis, and is the only visible symptom by which the presence of choroid inflammation can be ascertained.

It is most probable, that in all severe affections of the iris and sclerotic, the choroid is more or less involved; and conversely, it may happen, in some cases, that the choroid is the first seat of inflammation, which, extending to these tunics, is first recognised from the morbid vascular excitement in them. Now, we distinctly perceive the first changes produced by disease in the iris, cornea, and sclerotic; but with respect to the choroid, we must form a diagnosis obscurely, from the consequences of morbid action affecting other structures.

Unless, therefore, the formation of a red zone (which, you know, is characteristic of inflammation both in the sclerotic and the iris) could be proved decidedly to spring from an inflamed choroid, there exist no grounds upon which to form a diagnosis. From what we observe, I should say that acute choroiditis is never an idiopathic and separate disease, but invariably occurs in combination with some inflammatory action of the iris or sclerotic; and that a description of the symptoms of acute choroiditis must be entirely founded on conjecture.

An enlargement of the choroid from chronic disease is clearly indicated by its producing diffused Staphyloma of the sclerotic, from pressure and absorption; and this symptom is positively the only one by which the existence of a morbid condition of the choroid can



with certainty be determined. This appearance, however, is also caused by hydrophthalmia.

NOTE.—The diagnosis of Choroiditis cannot, from the situation of the affected membrane, be founded upon direct observation of its morbid aspect. Yet, though somewhat obscure, the disease seems to admit of recognition from collateral evidences. Thus, when a case presents itself, in which the transparent structures retain clearness little impaired, and no luminous spectra are perceived; but tensive pain and tenderness of the globe, and rapid failure of vision are complained of; and the sclerotic exhibits an inflammatory zone round the cornea; and soon the onset of a low form of iritis becomes apparent, disproportionate, and subsequent to the failure of vision: such a group of symptoms seems to point with no equivocal indication to the choroid as the prime seat of mischief. Probably it may be discovered that over-exertion of the organ, and impairment of constitutional power, have led to the attack; and these circumstances would suggest obvious provisions in the treatment: otherwise such a case must be treated just as the recent amaurosis or mild iritis would have been, had those affections been deemed of independent origin. In the resulting chronic state of staphyloma scleroticæ, after the cessation of inflammatory action, considerable benefit may sometimes be obtained by the internal exhibition of five or six minims of liquor potassæ arsenitis, three times daily. This medicine may conveniently be combined with infusion of gentian; and the continued use of an alterative mercurial at the same time is advantageous.

## HYDROPHTHALMIA AND ATROPHY.

HYDROPH'THALMIA, a dropsical accumulation of the humours of the eye, is usually produced by long continued chronic inflammation of the deep-seated tunics : its symptoms can hardly be mistaken. The globe is generally enlarged, and the aqueous humour secreted in greater proportion than the vitreous ; hence, if the cornea remain transparent, the size of the anterior chamber appears enormous.

Now and then, but not usually in the commencement, the cornea becomes more or less opaque. Amaurosis from distention of the retina frequently occurs in the earlier stages of the complaint, and always in its most aggravated form. Hydrophthalmia is not attended by any constitutional disturbance. Irritation, however, is often produced in the lids by the projection of the globe, and, therefore, surgical treatment becomes necessary ; when we can afford either temporary or permanent relief by operation. The palliative treatment consists in evacuating part of the morbidly increased humours through an aperture in the cornea or sclerotic, with the point of a cataract knife ; the disease, however, returns after this operation. The only radical cure is obtained by removal of part of the cornea, by an operation similar to that for staphyloma : the humours are of course evacuated, and the globe per-

manently collapses : hence this remedy is worse than the disease, and ought never to be had recourse to.

Occasional evacuation of the aqueous humour by puncture is generally the most eligible measure. Neither local applications nor constitutional remedies exert any beneficial influence on the disease ; which, if chronic, and of long standing, is incurable ; and is almost always so, even at the commencement. In some recent cases, however, the exhibition of mercury in combination with iodide of potassium has been useful.

Now, not only will internal inflammation of the deep-seated tunics of the eye produce enlargement of the globe in hydrophthalmia, or staphyloma ; but sometimes an opposite effect results from the same cause, complete wasting of the contents of the eyeball being an occasional consequence of continued inflammation.

This affection is called *Atrophia Oculi*, and commences as the inflammatory action subsides. It is preceded by amaurosis, and advances without any visible change of structure ; but progressive absorption takes place, the globe becoming first unnaturally soft, and afterwards flaccid. The lids gradually fall in ; and finally the organ shrinks to the size of a grain of hemp-seed, leaving the appearance of a hollow, or rather an empty orbit. Wounds of the globe have sometimes been followed by this disease, which is completely beyond the reach of medical or surgical assistance.



## SYNCHYSIS.

ANOTHER very curious morbid change is sometimes produced by chronic inflammation of the internal tunics of the eye, and often occurs without any obvious cause. It consists in a melting down or softening of the vitreous humour, which assumes a remarkably fluid consistence, and is partly absorbed.

The ciliary ligament becomes relaxed in consequence of the flaccid state of the globe which these changes occasion ; and hence the iris, though in colour, form, and brilliant radiated aspect, seemingly unaltered, yet having lost its natural support behind, instead of presenting its normal tension appears in constant motion, whenever the direction of the globe is changed in the slightest degree.

This tremulous quivering motion of the iris is peculiar ; and fluctuation of the aqueous humour is in addition seen in the anterior chamber : the affection is by no means rare.

Recollect, then, that a tremulous iris is a symptom of the melting down or softening of the vitreous humour, with diminution in the contents of the globe ; and that the relaxed state of the tunics is the immediate cause of the phenomenon.

This morbid affection is not unfrequently accompanied by opacity of the crystalline lens. In some cases the capsule and part of the lens become converted into

a chalky substance, distinguished by peculiar whiteness, and by great diminution of the lens. In most cases of Synchysis with tremulous iris, partial (and in some complete) loss of sight is the consequence. An operation, therefore, for the extraction of the opaque lens would be altogether useless.

The absorption of the vitreous humour is so inconsiderable, that no visible change is produced in the size and shape of the globe. Synchysis, though an incurable disease, is not invariably attended, in its earlier stages, by loss of vision ; for I have met with many subjects of it whose sight has been unimpaired : the functions of the eye are, however, generally disturbed or destroyed, whilst the appearance of disease is limited to the tremor of the iris, and fluctuation of the aqueous humour.

NOTE.—The iris frequently becomes tremulous after needle operations for cataract, without any material detriment to vision supervening either immediately or remotely.

## RETINITIS.

THE first idiopathic disease of the Retina which I shall describe is inflammation.

HISTORY AND SYMPTOMS.—Inflammation of the retina, or Retinitis, is an extremely rare disease, and almost always destroys vision : we are unacquainted with the causes of the complaint, but its characters are so well marked, that in practice it can never be mistaken. The symptoms are intolerable and distracting pain darting from the globe to the back of the head, perception of bright sparks and flashes of light, and total blindness in one or two hours. On examining the eye there is no evidence of inflammation in the outer tunics, the pupil is widely dilated and motionless, and the stimulus of light produces no aggravation of the symptoms ; increased irritability produces intolerance, but acute inflammation of the retina creates total paralysis. The choroid and sclerotic become inflamed in the progress of the disease ; \* but the sight is always destroyed before any marks of increased vascularity arise.

TREATMENT.—The treatment is too clearly indicated to require minute description : active general depletion of

\* Plate 6, fig. 1.



course is demanded, though antiphlogistic measures are merely palliative. The patient's sufferings may be alleviated, but the functions of the retina are most commonly destroyed before any remedies can be brought into operation.

In all cases, then, where there are produced darting distracting pain, dilated pupil, and total insensibility to light in a few hours after the first accession of disease, the prognosis must be unfavourable; for these are the symptoms of acute retinitis.

NOTE.—There is a form of Retinitis more frequently seen, but unfortunately little more remediable, than that described in the text. This disease, which is almost confined to elderly persons, and generally is associated with very defective constitutional power, (sometimes with gout,) is for the most part sudden in its onset and rapid in its progress, so that a few hours, or two or three days at farthest, suffice for the extinction of all useful vision. Giving an account of such speedy privation of sight, of the perception of luminous spectra, and of severe pain in or about the globe, the patient on presenting himself exhibits an eye disfigured by scattered distended conjunctival vessels, zonular sclerotic injection, dull anterior chamber, iris, and pupil; the latter soon becoming dilated and fixed, the lens discoloured, and the entire globe peculiarly hard. It is obvious from these symptoms, that, although the retina is originally affected, almost all the internal structures of the eye are eventually involved. Very guarded local depletion and counter-irritation, mercury to affect the mouth, and sarsaparilla or other tonics at an early period, have afforded most relief in the Editor's experience: but the disease is of a most intractable and disastrous nature.

## AMAUROSIS.

HISTORY AND SYMPTOMS. — Amaurosis, or Gutta Serena, is either functional or organic : by functional amaurosis, we understand temporary or permanent disturbance, or destruction, of the functions of the retina, without any sensible alteration of structure ; by organic amaurosis, we mean blindness, produced by a change of structure of the retina, or of parts connected with it. Organic amaurosis may be occasioned by the mechanical pressure of tumors upon the optic nerve, or within the globe ; by extravasation between the choroid and retina ; by dropsy, fungus, or other organic diseases beyond the reach of medical treatment ; or by concussion of the globe : it admits of no remedy, as it is impossible to remove the cause.

Functional amaurosis arises from various causes ; congestion is one of the most frequent : but, on the other hand, it may occur from one diametrically opposite ; for instead of congestion there may be deficient circulation in the part, and consequently an exsanguine appearance of the organ of vision, and of every other texture. In both cases, the disease may be attributed to an altered condition of the circulation through the vessels of the retina, and of the system generally.

In other instances, the retina and optic nerve sympathize with an impression made upon the brain by various

causes of nervous excitement, totally independent of any change in the circulating system. Thus, intense anxiety, and various mental emotions, will give rise to the production of partial or perfect amaurosis. Different stimuli may produce the same effect ; as exposure of the organ to an immoderate stimulus of light ; or unnatural excitement occasioned by the examination of minute objects—causes of morbid action which operate directly upon the retina.

When complete or partial loss of vision is occasioned by altered circulation, or by sympathy with other organs, or by an impression made immediately upon the eye by local stimuli, little change in the appearance will be observed in the first instance.

This is frequently the case in organic amaurosis also ; and, therefore, the distinction between the two forms of disease is not always effected from the local appearance, but likewise from the constitutional symptoms accompanying the complaint. Now, independently of the direct application of a stimulant in excess, the functions of the retina are frequently disturbed, from sympathy with the digestive or other important organs ; and most of the causes which tend to derange the nervous and vascular system generally, occasionally give rise to this disorder. The disease, then, is not confined to those who have over-exerted the organ in constant examination of minute objects, or in exposure to excessive light, — to persons who have induced morbid action from the direct over-excitement of the part ; but, as just intimated, we find it produced irrespectively of such local agency, in consequence



of disturbance in the functions of the uterus, from nervous exhaustion, or long continued and severe dyspepsia.

Occasionally no adequate cause can be assigned for the complaint; as when it occurs in individuals whose general health is, as far as we have an opportunity of judging, perfectly good; and in whom paralysis of the retina is the only indication of morbid action in any part of the system.

The apparent origin of amaurosis will of course assist you in prognosis; for, according to the control you may have over the cause of the complaint, will be the probability of a favourable result from your remedies.

The symptoms of amaurosis, from whatever circumstances arising, are subject to infinite variety; it occurs at all ages, and its progress is uncertain. I will, therefore, mention its ordinary symptoms; but recollect that they arise in no regular order, and only a few of them may be present, though the functions of the organ are destroyed.

In some persons the disease is first indicated by an alteration in the visual axis, the patient becoming either short or long-sighted. In others, indistinctness of vision takes place, or perhaps a cloudy haze is seen round objects. Now and then a black spot, or numerous floating bodies compared to cobwebs, feathers, or other flocculent substances, are described as constantly before the eyes.

The appearance, however, of small floating semi-transparent bodies is not in itself to be considered as a symptom of amaurosis; these, which are known by

the term “*muscæ volitantes*,” are extremely common, and frequently exist through the whole of life, without interfering with vision. *Muscæ volitantes* are, however, met with as a symptom of amaurosis; but then the clearness of vision is always to a certain extent impaired. Some persons, in the first stage of amaurosis, complain of seeing flashes of light, or luminous spectra: this symptom is always unfavourable, and is generally followed by irremediable blindness.

The retina may be rendered acutely sensitive, and objects appear unusually and painfully bright; or, again, of an unnatural colour, or distorted in shape. Some amaurotic patients are nearly blind during the day; but in the evening, when the stimulus of light is lessened, vision returns: there are others, in whom vision is only perfect during the day time. In the former case diminished light occasions a dilated state of the pupil; and as the central portion only of the retina is affected, the rays pass through the enlarged aperture in the iris to the surrounding surface of nervous expansion, which is healthy. In the latter, the retina is rendered morbidly obtuse in its perceptions, and requires a strong stimulus to affect it.

These, then, are the most common symptoms of incipient amaurosis; but as the disease increases, a change, subject to variety, takes place in the pupillary aperture without any marks of active inflammation, and frequently without any appearance of altered vascular action.

The most common alteration consists in a dilated state of the pupil; in rare cases it is contracted: now

and then it retains its natural power of motion ; but generally, whether contracted or dilated, it is motionless. A curious phenomenon is sometimes observed in the eyes of amaurotic individuals, which affords beautiful illustration of the sympathy between the two organs. A patient may be perfectly blind in one eye ; but if the two irides be examined together, as to the power of contraction of the pupils, both contract and dilate normally. In such cases, the impressions made upon the retina of the amaurotic eye might be supposed the cause of the motions of the corresponding pupil. This is not really the case ; for if the healthy eye be closed, the pupil of the other at once becomes motionless ; it is from sympathy that the impression upon one produces an effect on the other. Hence, in examining an amaurotic eye respecting the motions of the iris, it is always necessary to close the healthy organ, when the real influence of the retina over the iris of the diseased eye will be seen. In some cases, however, in which both eyes are amaurotic, the motions of the iris are performed naturally ; but in the great majority the condition of the pupil affords indication of a paralyzed retina.

We sometimes meet with amaurotic patients, who, in addition to the symptoms I have mentioned, from the commencement of the disease complain of pain in the orbit, forehead, or side of the head, dull pain in the motions of the globe, and dizziness or vertigo : these symptoms, however, are only occasionally present ; and the sight may be destroyed without any sensation of pain or uneasiness. In many cases the pupil loses its natural



brilliancy in consequence of a change in the vitreous humour, which, without losing its transparency, assumes a greenish colour, and hence gives rise to an appearance called glaucoma.\* Glaucoma is not necessarily a sign of amaurosis; many persons whose vision is perfect are glaucomatous; but when this appearance accompanies amaurosis the case is generally hopeless.

By whatever symptoms amaurosis is first ushered in, if uncontrolled by remedy it mostly terminates in total privation of sight. In organic amaurosis, where altered action is accompanied by altered structure, this misfortune is inevitable: but incipient amaurosis, produced or kept up by sympathy with disordered digestive or other organs, is, if neglected, equally liable to cause total blindness. In most instances, however, this sympathetic affection of the retina is at first remediable.

An amaurotic patient looks directly forward, with peculiar vacant stare, as if “staring into space”; and this appearance is so highly characteristic, that by it alone you may often distinguish amaurosis, combined with partial opacity of the humours, from cataract.

TREATMENT.—Amaurosis, I have said, is sometimes attended by congestion, sometimes by want of active circulation in the part, and now and then by functional derangement in the nervous system unattended by any obvious indication of altered action. In congestive amaurosis, you may observe, to greater or less extent, a turgid state of the veins of the head and vessels of the

\* Plate 11, fig. 3.

conjunctiva; it is usually met with in plethoric subjects. In such cases, the object being to lessen action, antiphlogistic measures must be adopted. General and local depletion, and a brisk cathartic, are therefore required in the first instance. If there is reason to believe that the disease is kept up by sympathy with a morbid condition of the digestive or other organs, the remedies best calculated to remove the existing cause must be exhibited. The patient should of course avoid stimulants, and be kept on low diet.

In the next place, you should give mercury with a view of affecting the system; and if, after a few weeks, the exhibition of this remedy produce no alleviation, the case will probably terminate unfavourably.

Mercury is as much a specific in congestive functional amaurosis as in syphilitic iritis; and when it fails to effect a cure, all other remedies are commonly useless. How mercury acts in these cases has not been explained, farther than that it produces a salutary effect by its operation upon the capillary system.

In congestive functional amaurosis, then, deplete, affect the system with mercury, and attend to the healthy condition of the constitution generally. In the incipient stage these remedies will arrest, and in many cases remove, the morbid action; but when the disease has been allowed to gain ground, and the sense of vision is once lost, or nearly so, you will hardly ever be able to save the organ. Incipient amaurosis is under our control; complete amaurosis is rarely benefited by medical treatment.

## ASTHENIC AMAUROSIS.

In Asthenic Amaurosis the circulation is feeble, the conjunctiva blanched, the sclerotic of a pearly white colour, and the countenance exsanguine. It is produced by exhaustion of the powers of the constitution from various causes—as repeated hæmorrhages, profuse floodings, and over-nursing; in both sexes it may arise from the debilitating effects of excessive sexual indulgence, and, in fact, from any cause tending to exhaust the energies of the nervous system. This form of disease is rarely met with in advanced age.

The treatment consists in giving alterative doses of mercury, and tonics both in medicine and diet. In some cases of Asthenic Amaurosis, I have seen benefit derived from the use of strychnine administered internally, and used as a local counter-irritant; in others, from veratrine employed in the same way; and in one or two instances electricity has appeared to be of service. The treatment, however, must generally be in some measure experimental; hence I advise you to give a very guarded prognosis, when called to a patient the subject of this complaint.

NOTE.—The term “amaurosis” comprises a variety of essentially different affections, having this in common (which may therefore be regarded as involving a definition of amaurosis), that all are productive of impairment or destruction of vision, independent of morbid change in the transparent media of the eye. Hence the word “amaurosis” is rather to be considered a term of convenience, adopted in order to avoid periphrasis, than the appellation of a distinct disease; and necessary as is, to a



certain extent, in the present state of our knowledge, a general treatment of the subject, yet the first object of the surgeon must in every case be, to ascertain, if practicable, the specific aberration from the state of health, of which loss of vision is symptomatic.

In many of the least remediable cases, a little careful inquiry will elicit clear evidence of original and important, perhaps organic, disturbance of the sensorium : in others, slighter symptoms may indicate merely transient cerebral disturbance, (perhaps original, perhaps induced by the arrest of an important secretion—as the catamenia, or by irritation in a distant part—as by worms in the intestinal canal,) through the medium of which the affection of the retina has been induced : in others, a large class, gastric disorder exists : in others, again, a departure from the condition of health may not be discoverable in any other organ than the eye ; or, if discoverable, may seem coincident simply, and unconnected ; neither tumor nor effusion may be traced in the vicinity of the optic nerve ; even the constitution of the patient may be free from appreciable error, though such exemption is comparatively rare ; the general powers may be neither unduly exalted nor depressed ; and, in short, every corporeal function, but that of vision, may be perfect.

The state of the globe itself, of its individual tunics and contents, especially as respects the reactions of the irides (separately and conjointly), demands close investigation in every case, whether other organs partake in its derangement or not ; for some evidence of pre-existing inflammation, or marks of present morbid action in a particular constituent of the globe, which might lead to more accurate diagnosis and perhaps explain the whole case at once, may otherwise escape observation. Morbid vascularity of the conjunctiva, or sclerotic, or iris ; alteration in form, or colour, or tension of the sclerotic ; adhesions, or dulness, or indolence of the iris ; enlargement or diminution of, and the semblance of deep-seated or superficial opacity within, the area of the

pupil; these are the ordinary abnormal variations to be looked for, and their presence or absence should be noted.

Lastly, the history of the case deserves more careful investigation than in many diseases; inasmuch as it may afford that evidence of the nature of the malady, which physical examination fails to supply. Not again to particularize different circumstances affecting the general health of the individual, which can only be made known in this way; by inquiry into his history, especially into the exigencies of his occupation, it may possibly be learned that the eye has been habitually abused by too minute or too long continued exertion by insufficient, or excessive, or glaring artificial light; that hence, with or without *muscæ*, temporary impairment of vision, and sense of weariness of the organ, indicative of congestion of the choroid,—or perhaps flashings, sparklings, and similar luminous spectra indicative of retinal mischief,—accompanied or not by characters of deep seated inflammation, as pain, tenderness, and redness of the globe,—have ushered in the still more formidable ulterior symptoms.

These various points can only be thus summarily alluded to on the present occasion: the subject is far too extensive and complicated to be treated within brief limits; but it is by patient inquiries alone, such as those sketched, that cases of this multiform disorder can be fitly discriminated, or truly scientific and efficacious plans of treatment be devised and established.

## CATARACT.

HISTORY AND SYMPTOMS.—Whenever the crystalline lens or its capsule, instead of preserving the transparency natural to them, becomes opaque, the affection is called Cataract ; which may, therefore, be defined an opacity of the lens, of its capsule, or of both. The existence of cataract is known by opacity in greater or less degree immediately behind the pupil. The morbid change may occur as an idiopathic disease, as the effect of inflammation propagated from surrounding parts, or as a consequence of mechanical injury, wounds, &c. The cause of idiopathic cataract is not known ; it occurs at all ages and in all constitutions, and is usually rather slow in its progress. It is generally found in both eyes of the same person ; the two cataracts being sometimes formed at the same time, but more frequently in succession. When cataract arises from inflammatory action or mechanical injury, it is more quick in its progress (a day or two being sometimes sufficient for the development of the complaint), and its existence in one eye need not lead you to expect its subsequent occurrence in the other.

At first the sight is generally weakened, and distant objects are distinguished with difficulty : after a time nearer objects are rendered indistinct, and appear as if seen through a mist.

In the early stage of the complaint, a central spot of



opacity is now and then formed, which completely intercepts the rays of light when the pupil is closed ; but is not large enough to obscure vision when the pupil is dilated, and the rays are permitted to pass through the circumference of the lens. In these cases, consequently, the patient sees tolerably well in a darkened room, or with his back to the window, owing to the pupil being then more dilated than under the impression of strong light ; and the application of belladonna of course improves vision in the same way. When the change of structure has extended over the whole crystalline, a dilated pupil is of no assistance.

DIAGNOSIS. — The patient complains, as already mentioned, of a constant mist before objects, which therefore appear dim (but not altered in form or colour), and the flame of a candle seems surrounded by a halo.

This symptom is an attendant upon amaurosis with glaucoma, but the two diseases may be distinguished by the following marks. In cataract the halo is always white ; in amaurosis, usually of different colours. Cataract, uncombined with other disease, is never attended by pain or uneasy sensation in the globe, or the appearance of floating bodies or of flashes of light before the eyes ; while the opacity is immediately behind the iris, and visible in an oblique view,—glaucomatous opacity being deep-seated, and not fixed to one spot close to the iris. The motions of the pupil, too, are natural ; which is never the case with amaurosis, when combined with a sufficient degree of glaucoma to simulate incipient cataract. In cataract, uncom-

bined with amaurosis, the patient is always able at least to distinguish light from darkness; and the imperfection of sight is adequately accounted for by the visible alteration in the lens: this is never the case in amaurosis. The diagnosis is of consequence, for, in cases of amaurosis, we have no time to lose; in cataract, the delay of remedies is immaterial.

VARIETIES.—Opacity of the lens and capsule is attended by various morbid changes of texture. The crystalline is sometimes hard, almost of a horny consistence, and even ossified in rare cases; while the healthy degree of firmness is met with in others: again, the lens often becomes soft, of the consistence of cream. The colour, too, varies very much; thus, yellow, blue, pearl-coloured, silvery white, brown, black, speckled, or striated cataracts, are occasionally met with; but the colour after extraction does not always correspond with that exhibited before.

As different operations are required for cataracts of different consistence, it is, of course, very important that the diagnosis should be accurate and clear. In many cases we can form a correct opinion respecting the precise condition of the opaque lens, and of its capsule, by distinct characters, but in others our diagnosis must be founded in conjecture. For it is not possible, in all cases, to pronounce whether the cataract be hard or soft; or whether the lens only, or both the lens and capsule, be the subject of morbid change. You must therefore be guided in some cases by general rules; but in others the consistence of the opaque structures, as just said, will be clearly shown by certain characteristic marks.



You must form your diagnosis from the age of the patient, and the size of the lens. Hard cataract, which usually begins to form in the centre of the lens, is never found in infants or children, but is the form of disease to which elderly persons are liable. Hard cataracts are seldom of equal consistence throughout, the centre being generally more dense than the circumference.

In examining a cataract, it is necessary to apply belladonna to the eye-brow, in order to ascertain whether the iris performs its functions healthily, that is, whether the pupil is fixed or moveable ; and also to obtain a view through the dilated pupil of the whole of the diseased lens. It is only by dilating the pupil that you can determine the precise condition of the entire crystalline.

A hard cataract in adults is not attended by an increase in size of the lens ; you therefore see a space between the margin of the pupil and the opaque body, and the iris invariably retains its natural flatness. The usual appearance of the centre of a hard cataract is yellowish, and sometimes amber-coloured ; the circumference is lighter and of a greyish tint : some have been met with of a dark brown or chesnut colour.

It often happens that the lens assumes a radiated appearance, the radii usually commencing from the centre : such cataracts are always slow in their progress, and seldom produce the same degree of blindness as an amber-coloured lens. When the capsule becomes opaque it frequently assumes a radiated appearance, which might be mistaken for the lenticular disease I am describing. But radiated capsular cataract may



always be distinguished by its situation. You see it directly behind the pupil, and lying on the anterior surface of the opaque lens: whereas, when the lens assumes a radiated appearance, the radii are deep-seated, and extend through the whole of the opaque body. When the capsule is rendered completely opaque, you must be guided in diagnosis respecting the lens by its size; recollecting, that if the iris retains its naturally flat appearance, there being then no evidence of increased size, in all probability the cataract is hard.

In soft cataract the lens is generally enlarged, and presses forward the iris so as to make its anterior surface convex. Another change, produced by this pressure upon the iris, is the appearance of a distinct black margin around the pupillary aperture, rendered strikingly distinct by contrast with the white cataract behind. This black ring is occasioned by a portion of uvea being pressed over the edge of the aperture.\*

Soft cataracts are often found in children at the time of birth; and in these cases the change of structure is sometimes partial, a small central defined portion only being opaque. Such a white spot of cataract, when idiopathic, is always congenital;† for when the centre of the lens becomes opaque in after life, a greater or less degree of diffused opacity surrounds the spot.

Soft cataracts in children are almost universally combined with opacity of the capsule; but in adults they may form without. Sometimes, in congenital cataract, the lens, instead of being increased in size,

\* Plate 14, fig. 2.

† Plate 14, fig. 3.

is shrunk ; in soft cataract, however, which forms after birth, the lens is very generally enlarged, and pushing against the iris.

That in young persons we never have hard cataract, should be strongly borne in mind ; and an amber-coloured appearance in the pupillary aperture must never in children, as in adults, be considered merely an indication of cataract. Yellowish brown opacity in the humours of the eye of a very young child is a sure sign of destructive deep-seated disease.

Cataract is sometimes of a mixed character, the centre being hard, and the circumference soft or almost fluid ; and there is no diagnostic mark between this and hard cataract.

Sometimes the capsule becomes opaque before the lens exhibits any change of structure, and the disease is then called Capsular Cataract. Capsular Cataract begins to form at the circumference, and is at once known by its situation, and by the silvery-white radiated appearance which it presents,—an appearance somewhat resembling that which might be produced by delicate radiated layers of asbestos or talc, laid upon the lens. The opacity in course of time extends from the circumference towards the centre, and the whole capsule eventually becomes involved in the disease.\*

When the anterior segment of the capsule is the seat of opacity, the disease is called Anterior Capsular Cataract ; when the posterior portion, which is behind the lens, Posterior Capsular Cataract ; and when both are

\* Plate 14, fig. 1.



at once opaque, Complete Capsular Cataract. The first is easily detected ; and when the posterior capsule is alone rendered opaque, the disease is readily distinguished by the silvery colour and concave surface of the opacity, and by its distance from the pupil : but complete Capsular Cataract can never be detected whilst the component parts of the organ remain in their relative situation ; for, in such cases, the lens always being opaque, the opacity of the posterior capsule cannot be seen, until both the lens and the anterior capsule are removed.

In all Capsular Cataracts the lens in course of time becomes opaque to a greater or less extent, either in its superficial layers, or throughout its whole substance. In one case the lenticular disease may be hardly perceptible ; in the other it is distinct.

Now, complete opacity of the lens is always apparent ; but when the lenticular cataract is soft, and its milky whiteness therefore affords no contrast to the silvery hue of the capsule, both appear to form one continuously opaque body, and an altered condition of the capsule will then sometimes escape notice. When both capsule and lens are affected, the disease is called Capsulo-Lenticular ; and this is a very frequent form of the complaint.

Sometimes Cataract is combined with glaucoma, and no diagnostic marks of this disease are visible ; at other times, you may be led to suspect a change in the condition of the vitreous humour, by accompanying symptoms ; the iris, for instance, may be altered in colour, the pupil fixed and dilated, or the sight com-



pletely lost. The best marks of distinction between cataract in a healthy, and cataract in an amaurotic eye, are afforded by the motions of the pupil, the presence or absence of uneasiness or pain in the part, and the degree of imperfection of vision accompanying the disease.

A motionless state of the pupil is sometimes produced by adhesions ; but in these cases the pupil is not dilated, and is generally irregular in figure ; and the distinction between light and darkness is not destroyed, unless the retina is in a morbid condition.

Having given you this general description of the appearances presented by different forms of cataract, I shall now endeavour to make you acquainted with its treatment.

PROGNOSIS AND TREATMENT. -- The treatment of Cataract consists in mechanical removal of the opaque lens and capsule from the axis of vision, by surgical operation. No local application or constitutional remedies afford the slightest relief. Before, however, I describe the different operations required for this purpose, I shall mention a few rules, by which you should be guided in determining upon the propriety and probable result of an operation ; for success depends, in great measure, upon their observance.

If the lens or capsule is the only part of the eye diseased, and your patient is healthy in constitution, and temperate in his habits ; or, if the disease occurs in infants as a congenital affection, it will, in almost all

cases, be your own fault, should the operation terminate unfavourably.

Therefore, when the imperfection of vision can be accounted for by proportionate opacity behind the pupil, and the pupillary aperture dilates and contracts freely, the formation of the cataract not having been attended by pain or uneasiness in the globe, orbit, or forehead, the retina under these circumstances being in all probability healthy, your prognosis may be favourable, especially if the disease occurs in infants or young persons.

When the complaint is met with in the middle periods of life, in a plethoric robust subject, and arises remotely from inflammation of the deep-seated tunics—particularly if adhesions should have formed between the margin of the pupil and capsule of the lens, and cataract has formed in one eye only, the other being glaucomatous—the result is extremely doubtful.

In the middle periods of life, and in robust constitutions, excessive inflammatory action is to be feared. If opacity is produced by general inflammation of the tunics, you cannot precisely tell how far the retina may be affected from the same cause; if adhesions have formed between the capsule and pupil, force is necessary to break down those adhesions, which may give rise to serious inflammation of the iris; and when the opposite eye is glaucomatous and amaurotic, glaucoma almost invariably exists behind the cataract too.

Again, if the cataract is combined with hydroph-



thalmia, or with a pupil contracted and closed from gout or rheumatism ; or if accompanied by a general varicose condition of the blood-vessels, or by the occasional appearance of flashes of light and *muscæ volitantes* ; or, above all, if the patient is unable to distinguish light from darkness,—the result of an operation would, in all probability, be unfavourable.

There are many cases in which some of these objections may be urged against the performance of an operation, wherein palliative treatment is required. Thus, for instance, an old person of feeble constitutional powers may be the subject of a cataract, which will remain stationary, and produce imperfection but not destruction of vision ; so that his ordinary means of occupation and enjoyment may be tolerably well continued.

Now, in such cases, great temporary benefit may be obtained from the application of belladonna, which, by dilating the pupil, allows more rays of light to pass ; and as the restorative powers are feeble in old age, it is better, should the disease not materially interfere with the comforts of the patient, to adopt this palliative treatment, than to hazard total destruction of the organ.

In old persons, if one eye alone is the subject of disease, we are not justified in putting the patient to the unnecessary risk of an operation. In all probability the other eye will eventually become affected, and it will then be time enough to operate : the removal of a cataract from one eye will not prevent its formation in the other.



When a cataract is complete in one eye, and is progressing in the second, the operation should be performed before sight is completely lost. Whether in old or young persons, there can be no actual necessity for interference until the cataract is perfect ; but young people, to whom personal appearance is an object, sometimes require the removal of an incipient cataract, —an operation not attended by more unfavourable results than that for one perfectly formed.

If both eyes are affected, in a favourable subject, the sooner the operation is resorted to the better. In feeble and aged individuals, however, as before intimated, it is not justifiable to perform an operation for incipient cataract ; for the disease is often extremely slow in its progress, and the remainder of life is not in any way deprived of its comforts by the trifling imperfection of vision, which partial opacity occasions.

NOTE.—The suggestion of the late Professor Sanson, commonly known as the catoptrical test, is sometimes no less useful in practice than it is elegant and ingenious ; it is mentioned in this place as supplementary to the means of diagnosis explained above. This test is founded on the fact, that in the healthy eye certain luminous rays are arrested in their progress through the transparent media, and instead of being transmitted onwards to the retina, are reflected. If proceeding from a sufficiently brilliant and circumscribed source, they are thrown when reflected into the form of perceptible images of the object emitting them ; and in this form become apparent to an observer at the three points where membranous surfaces create this reflection in the highest degree,—that is to say, at the cornea, and at the anterior and posterior capsules of the lens.

Thus the flame of a candle held before the eye of a healthy

subject in a darkened chamber, especially if the pupil be dilated by belladonna, is triply portrayed upon and within the organ. The corneal image is erect, clear, and obvious to any beholder: that of the anterior capsule, likewise erect, is smaller, more faintly depicted, less defined, and apparently very deep-seated: both 'follow' any motion which may be given to the candle. The posterior capsular image differs from the others, in that it is much more minute than either, is intermediate in its degree of brilliancy, is seemingly intermediate in position, is inverted, and travels in a direction precisely the reverse of that which the candle and its two erect images pursue. Hence, as the candle is moved from right to left, this deep image appears to cross between the others from left to right, and so on; its inversion, contrariety of motion, simulated relative position, spark-like minuteness, and comparative brilliancy, being all optical phenomena dependent upon the concavity of the surface producing it.

Now the influence of glaucoma, and of cataract respectively, in modifying the reflections just described in the healthy eye, are diametrically opposed. Glaucoma (except in its most advanced degree) leaving the crystalline pellucid, but impairing the transparency of the vitreous humour, has the effect of rendering the deepest or inverted image more conspicuous than before; while the anterior capsular reflection long remains totally unaffected. On the contrary, cataract, consisting in opacity of the lens or anterior capsule, necessarily at a very early period obscures, and soon altogether obliterates, the deepest inverted or posterior capsular image; before long it renders the deeper erect one indistinct, and ultimately deprives it of all definite form. These widely contrasting results give the catoptrical test great value as an auxiliary in diagnosis; sometimes enabling the surgeon thereby at once to pronounce a decisive opinion as to the existence or non-existence of commencing cataract, when, without this assistance, he would have hesitated in doing so.

For the purpose of catoptrical examination, and for constant use as a palliative remedy in cataract until the advance of the disease makes further delay in operating irksome to the patient, a collyrium, formed of two or more grains of atropine in an ounce of water, (a drop or two of ether being used to promote solution of the alkaloid) is preferable to that made with the extract of belladonna, because more cleanly, powerful, and quick in action.

Occasionally, incomplete cataracts in adult subjects, and frequently congenital cataracts, illustrate that tripartite division of the lens described by Sir David Brewster in the *Philosophical Transactions* for 1836, as the normal condition in certain mammalia. In these cases, the opacity is most dense and conspicuous along three equidistant radii, which diverge from the central axis, and obviously correspond with the three anterior lines of junction or septa of the crystalline. The circumstance is mainly interesting as confirmatory of a point in structural anatomy.



## MALIGNANT DISEASES.

MALIGNANT diseases of the globe of the eye, assuming as they always do a truly fungoid character, in no respect differ from fungoid disease in other parts, where structures occur analogous to those composing the organ of vision. The disease is in the first instance apparently local; but in course of time we observe a constitutional tendency to the development of the peculiar morbid change, which eventually terminates in destruction of life.

Now, in tracing the progress of interstitial malignant growth in the eye, we are furnished with beautiful illustration and proof of a fact for the discovery of which we are indebted to the persevering scientific investigations of our distinguished countryman, Dr. Hodgkin. This relates to the pathological characters of malignant disease, as contrasted with other formations apparently cancerous or fungoid.

Formerly, we were taught to believe that chronic glandular tumours, and morbid enlargements of the tissues of the human body, may, and frequently do, undergo conversion into malignant structure; that, to use a familiar phrase, "chronic tumours pass into a cancerous state." By this expression is of course understood, that two diseases run one into the other; and consequently, that the action of those self-same capillary vessels, which at first occasioned the formation of mere chronic interstitial enlargement, is (under such circumstances) so entirely changed, as to occasion the effusion of

cancerous deposit capable of blending with the prior product of inflammatory or other morbid action essentially different from that attending malignant disease.

Whatever may be the case with the better informed members of our profession, I believe that these confused and incorrect notions of the pathology of cancer still obtain with many. Knowing, therefore, that the diseases of the eye are inseparably connected with general pathology, I do not consider it a digression to dwell rather fully on a subject of so much importance.

I must refer you, however, to Dr. Hodgkin's work on this subject,\* which I think will convince you, that malignant tumours are formed by the adventitious growth of cysts closely analogous to serous membranes; that, when occurring in combination with chronic tumours, the malignant cysts are circumscribed and distinct; and that, in proportion to their increase, will usually be the absorption of the previous chronic deposit—not the conversion of that deposit into cancerous or fungoid matter. The appearance of such cysts of the melanotic kind is shown in Plate 10, figs. 2, 3, and 4.

Melanosis and fungus hæmatodes of the globe are not very uncommon: they are essentially the same in their general character; but still, in the organ of vision, as in other organs of the body, they present very different appearances. It therefore may be as well to describe them separately.

\* Lectures on the Pathological Anatomy of the Serous Membranes, by Thomas Hodgkin, M.D.

## MELANOSIS.

**HISTORY AND SYMPTOMS.**—Melanosis of the eye, which is rare in children, usually occurs in middle-aged or old persons; so far as I know, it always begins in the interior of the globe, and generally at the posterior part. It is rapid in its progress, occupying from twelve months to two years before the destruction of life: it is accompanied by pain in the eye and head, and by amaurosis, and in a short time the organ begins to swell. The enlargement is usually first manifested about the junction of the cornea with the sclerotic; but the general surface of the globe becomes discoloured at an early period, and assumes a blueish or leaden tint, and the lens also becomes discoloured. The enlargement next increases, so that the eye-ball protrudes between the lids, presenting the appearance of a dark, livid, globular tumour; the lids themselves then become swollen, and of a dark, dirty purple colour.\*

As the disease proceeds, constitutional irritation arises to greater or less extent. In the course of a few months, the sloughing process generally supervenes on the surface of the discoloured, swollen, and disorganized globe; by the loss of substance thus occasioned the increase of the tumour is limited: and

\* Plate 10, fig. 1.



hence in true melanosis it is rarely very enormous. Melanotic tumours of the eye are sometimes larger than that represented in figure 3, Plate 5, but never acquire the enormous size of fungus hæmatodes: figure 1 of the same plate represents abscess of the globe and slough of the cornea; and figure 2 shows the appearance of staphyloma of the sclerotic from choroiditis. This latter disease occasions discolouration of the sclerotic, which may be distinguished from malignant discolouration by the apparent absence of non-inflammatory morbid change in the pupillary aperture.

After a time the disease extends along the optic nerve to the brain; other organs then become affected; and thus the whole system suffers from a malignant affection, originating in a circumscribed spot. The veins of the conjunctiva are always enlarged, so that the surface of the globe appears covered by a network of varicose vessels; and in the latter stages, a dark-coloured fungous excrescence sprouts out, and profuse and repeated hæmorrhages ensue; the whole organ being at length converted into a dark, mottled, fungoid mass of medullary consistence.

On making a section of the tumour, the greater portion appears of a blackish or dark-brown colour, readily yielding to pressure; the fluid contents are sometimes nearly as dark as common writing-ink, and the mottled appearance arises from the exposed cysts contrasting with contained patches of fungoid matter.

TREATMENT.—The treatment of this complaint may be either active or palliative; but if the sloughing

process has been set up, the latter only is admissible, for no ultimately successful operation can be performed. Opium may then be used locally and generally; and the debility which accompanies the disorder must be combated by appropriate means. With this view, generous diet without stimulants, and the use of ammonia, as a medicinal agent, will be found useful: local depletion may be required when pain is excessive.

When the disease is incipient, and the globe is enlarged only at the ciliary circle, permanent relief may be afforded by extirpation; for, in some cases, the complaint has never returned after removal of the eye at this stage. When, however, the fungoid growth is fully developed, and the constitution has suffered, an operation is quite incapable of affording permanent benefit. The operation being precisely similar to that required in cases of fungus hæmatodes, I shall describe that disease before the operation for removal of the eye.

## FUNGUS HÆMATODES.

HISTORY AND SYMPTOMS. — This is more frequently met with than any other malignant disease of the eye, and is precisely similar in all essential characters to fungus hæmatodes in other parts of the body. It commences in one spot, and without necessarily producing constitutional disturbance in the first instance, acquires an enormous size from the rapid growth of the fungous excrescence ; which, pressing upon surrounding parts, excites ulceration and absorption of the neighbouring textures. It usually occurs in the earlier periods of life, and has even been met with at the age of six months.

The disease is generally in its commencement unattended with pain ; and shows the first sign of its existence in the pupillary aperture, which is dilated and fixed, and exhibits a deep-seated bright metallic appearance. Sometimes a deep-seated tuberculated tumour is observed, over which a number of blood-vessels are distinctly seen ramifying\* ; and whenever these appearances are present in young persons, the eye is completely amaurotic.

As little or no inconvenience is produced by this complaint in its first stage, the friends of the patient are in some cases the first to detect its existence ; and there is often amaurosis in one eye, while the subject

\* Plate 11, fig. 1.



of it is often unconscious of any disease. After a few weeks, pain and uneasiness are felt, and general increase of vascularity is observed ; the lens becomes opaque, and is for the most part amber-coloured,—an appearance, as I have said on a former occasion, highly symptomatic of malignant disease in children ; and fungus now begins to fill the interior of the globe.

In this stage, however, the opaque lens completely hides the fungoid growth behind it ; and, therefore, in young persons we are only made acquainted with the real nature of the complaint, by a knowledge of the fact, that an amber-coloured lens seldom if ever occurs in early life, except as a concomitant of malignant disease. When an amber-coloured lens is produced in adults as an accompaniment of fungus, and we are unable, in consequence, to see the fungoid growth, we must be guided by other symptoms,—the sensation of pain, the condition of the pupillary aperture, and the state of perfect blindness.

But in the last stages, the nature of the complaint can never be mistaken ; the globe becomes enormously swollen from the growth of the fungus within, is discoloured by inflammation, and pain is extreme. At last, the iris and cornea give way ; the fungus projects externally ; an ichorous discharge is poured out ; repeated hæmorrhages ensue ; and the patient dies exhausted\*.

DIAGNOSIS AND TREATMENT.—Advanced fungus can only be confounded with abscess of the globe : but in

\* Plates 8 and 9.

the latter, extreme pain is felt from the commencement; excessive vascularity with chemosis accompanies the other symptoms; matter forms generally in a few days; and the surface of the globe is round and smooth; while the cornea, at first white, becomes afterwards of a dark-greenish colour from slough\*. In fungus, the vascularity, pain, and chemosis, arise after the globe has been considerably distended; and the surface of the eyeball presents numerous globular or tubercular projections, from the unequal pressure of the fungus within. Frequently the morbid growth extends along the optic nerve to the brain; at other times it is confined to the globe, and may there acquire an enormous size.

This disease is almost invariably fatal. The period at which it destroys life is various; sometimes a few months only, now and then a year or two, elapse before death is occasioned; but in adults the complaint is often more protracted than this.

Children are, in some rare cases, the subjects of a morbid growth within the globe, which presents nearly the same appearances, in the commencement, as fungus hæmatodes; and, therefore, until true fungoid enlargement of the eye has been manifested, you will not be justified in proposing, in children, that horrible and painful operation, removal of the organ.

The disease, which may be mistaken for incipient fungus, is confined, it would appear, to the vitreous humour; and never, I believe, terminates fatally. The

\* Plate 5, fig. 1.

humour is converted into a morbid grey mass, which, in consistence, has been compared to boiled rice. The globe is not enlarged; but a metallic reflection, similar to that seen through the pupil in cases of fungus, is observed. The first appearance of the two maladies is, therefore, nearly the same; but their progress is widely different: for in the non-malignant affection, instead of enlarging, the globe after a time becomes diminished in size, shrinks within the orbit, and being permanently disorganized, remains free from pain. This disease is, I believe, confined to children; I have not seen it in the adult. Now, as it is quite impossible to distinguish incipient fungus from the morbid change of the vitreous humour just described, the cruelty of performing the most painful operation of extirpation, until enlargement of the globes proves that the disease will admit of no other remedy, must be apparent. Moreover, the extirpation of a fungoid eye, even in the earliest stage, is hardly ever productive of permanent relief in the case of children; and can scarcely be considered even of temporary benefit, since the complaint almost invariably returns, and occasions death, in nearly as short a time, as when left to nature.

This is not the case in adults. In some instances, the disease has been many years in returning; and in others, has not re-appeared at all. Never, therefore, remove a fungoid eye from an infant or child, without making the parents fully aware, that temporary relief from pain is the only result you can promise; and never, for a moment, think of proposing the operation,



until the fungoid nature of the disease is fully developed. The palliative treatment of fungus is precisely the same as that proper in cases of melanosis ; and comprises the use of opium locally and constitutionally, with local depletion. When an attempt at permanent relief is justifiable, the operation may be performed in the following manner ; the patient, of course, having been prepared for ten days or a fortnight previously by an alterative course of medicine, the bowels having been cleared every other day, and stimulants avoided.

#### OPERATION FOR EXTIRPATION OF THE EYE.

Place the patient in a recumbent posture, the head being fixed by an assistant ; divide the lids at the outer canthus ; then, by passing a crooked curved knife from the outer side down to the optic foramen, divide the optic nerve ; and afterwards dissect out, not only the globe, but the whole contents of the orbit. Bleeding from the ophthalmic artery can be controlled in most cases by the pressure of a pledget of lint ; and sutures are rarely required, unless the tumour has been of great size. A light bread and water poultice should be applied ; and the patient should be kept on low diet, to prevent excessive inflammatory action, which might extend to the dura mater. The granulations thrown out from the cavity of the orbit during the healing process unite well with those of the posterior surface of the lids ; these fall in, and leave a depression at the former situation of the globe.

NOTE.—The admonition of the text, not hastily to condemn a child as the subject of malignant disease, because a straw-coloured metallic reflection is perceptible at the fundus of the eye, the organ being at the same time amaurotic, is entitled to the utmost attention. Cases do unquestionably occur, (such have fallen under the Editor's personal observation), wherein a deep-seated reflection, indistinguishable by mere external characters from that associated with fungus, is visible for a length of time without the patient suffering in general health, or betraying any other symptom indicative of malignant disease. In front of the morbid appearance, ramifying blood-vessels are occasionally seen, of which it is difficult to determine the precise position, or to say whether they be new developments spread over the opaque surface, or merely normal offshoots from the central artery made manifest by the new formation of a light-coloured background. In some cases similar deep opacity becomes observable as a sequel and evident effect of injury to the globe; under which circumstances it would seem, with greatest reason, attributable to the organization of fibrin effused more or less directly in consequence of the injury. Probably, in other cases, the appearance is produced by the same morbid product; though the development of an entirely new structure, (as in cases of malignant fungus, and of the other organic disease alluded to by the author), as also inflammatory opacity of the retina, and possibly other conditions, may create it.

The small amount of structural deviation from the state of health, which will suffice for the production of such abnormal reflection, may be readily conceived, when it is remembered that an appearance closely allied to that under discussion, and to that which characterizes 'cat's eye anaurosis,' is perceptible in the healthy eye, when examined in a particular manner; a fact first observed by Dr. Cumming, and communicated by him to the profession in the 29th volume of the Medico-Chirurgical Transactions. The subject of experiment should be seated in a darkened room, at the distance of ten or

twelve feet from a lamp, isolated rays from which are allowed to stream horizontally upon his face: the observer placing his own head close to the lamp but shielded from its light, will, when a neighbouring object is looked at by the other person, perceive his pupils gleaming like those of a feline animal. The essential conditions for the success of the experiment are, the confinement of illumination to the subject of it, the incidence of direct rays from the lamp upon the retina and choroidal pigment, and such position of the observer as may permit all rays reflected again therefrom to reach his own eye unintercepted by the irides of the person examined.

The presence of the *pigmentum nigrum* has so great a tendency to impart to irregular morbid distension of the sclerotic, from chronic inflammatory or other effusion, the aspect of melanotic fungus; that it is desirable in all cases of supposed malignant disease, if the surface of the sclerotic be yet entire, to puncture it and mark the result, before proceeding to the loathsome even though necessary act of extirpating an eye. The performance of this operation is much facilitated by passing a needle, armed with a strong double ligature, through the prominent portion of the globe, as soon as the outer canthus has been divided; in order to afford the surgeon a firm hold upon the part he is removing. There is also considerable advantage in dividing the muscles, optic nerve, ophthalmic artery, &c., by scissars curved on the flat, instead of by the knife: the latter instrument is of course preferable for the earlier stages of the operation.



## OPERATIONS FOR CATARACT.

It is not my intention to give a minutely detailed account of the operations required for the cure of Cataract ; a general description is all that can be necessary or useful, in lecturing or writing upon the subject. The operations must be seen upon the living, before the exact mode of procedure can be clearly understood, or the young operator be enabled to make his first essay, with confidence in himself and comparative safety to his patient.

The practical instruction obtained by attendance at an ophthalmic institution, is absolutely necessary for the guidance of a beginner : without this, he can have no idea of the difficulties which an operating ophthalmic surgeon has to encounter ; nor can he, otherwise, make himself acquainted with the best means of avoiding and surmounting them. By the aid of diagrams, I can explain my verbal description of the operations ; and can give general rules as to the safest and best mode of performing them : but to attempt more than this would be useless ; your own personal observation, in the wards of our Eye Infirmary, must supply the necessary illustration.

Now, before any attempt is made to remove an opaque lens from the axis of vision, a preliminary course of treatment is essentially necessary, in order to prevent excessive inflammatory action, after the operation has

been completed. The necessity for after depletion must, in all cases, be obviated as far as possible by prophylactic measures; and perhaps it is more necessary to attend to this point, in operations upon the eye, than in those on any other part of the body. For instance, after an amputation, after removal of a tumour from the body or a stone from the bladder, however long the divided surfaces may be in healing from failure of adhesion owing to neglect of this precaution, the patient may be satisfied with the conviction that the object of the operation has been accomplished, for the parts have been taken away which it was intended to remove. But if you extract a cataract from a cachectic patient, neglecting the state of his general health; and find from such negligence that unhealthy action is set up in the parts you have divided, and that immediate union is prevented; although you may have been successful in the first object of your operation, removal of the lens,—yet failure in the ultimate object, restoration of sight, is almost inevitable. For the aperture in the cornea being left unclosed, the iris will prolapse, and part of the contents of the globe escape; and hence the hopes of restored vision being disappointed, discontent on the patient's part, and loss of reputation on your own, will too frequently result.

So, in other operations on the eye, failure may often be the consequence of neglecting the state of the constitution beforehand. Be extremely careful, then, not even in the most favourable cases, absolutely to promise the success of an operation for Cataract; but always endeavour to ensure success by every means in

your power, and especially by proper preliminary measures.

You must be aware, that in giving instructions for preparatory treatment, I can lay down no formal fixed rules which will be applicable in all cases; you are to be guided by general principles, remembering that the object is to reduce vascular action below the standard of health, and to ensure a healthy performance of the functions of the different organs of the body, particularly of the digestive organs. Having done this, and arrived at a conviction, that with the exception of opacity of the crystalline lens the eye is healthy, you may safely operate without any well-grounded fear of serious consequences, provided the operation is properly performed.

There are three modes of operating for the removal of an opaque lens from the axis of vision: viz., by extraction, depression, and solution.

In performing extraction, we make a section through the cornea of sufficient extent to permit the escape of the lens, which passes, of course, through the pupillary aperture. The divided surfaces re-adhering, the humours of the eye are retained, protrusion of the iris is prevented, and the organ in time is restored to its former shape and condition, except that the lens is deficient.

In the operation for depression, the lens is displaced, and pushed from the axis of vision downwards and backwards into the vitreous humour; where it afterwards remains, producing no irritation, or becomes absorbed.



Solution of a Cataract is accomplished, by bringing the opaque lens forward in contact with the aqueous humour, in which it is dissolved; it is subsequently absorbed.

#### OPERATION FOR EXTRACTION.

The patient should be placed in a recumbent posture, and the head be firmly held by an assistant, who with his fore finger raises the lid without making pressure upon the globe. The surgeon then, with his fore and middle fingers, depresses the lower lid, taking care also to avoid pressure upon the globe, particularly at the outer part. The next step is to endeavour to make a section through half the circumference of the transparent cornea, at the distance of a line from its junction with the sclerotic. The mode of accomplishing this object is represented in Plate 15, Fig. 1, 2, 3, and 4; and to a good operator it is immaterial whether he uses for the purpose the cataract knife recommended by Beer of Vienna,\* or that which Baron Wenzel always employed†. The point of either instrument is to be passed through the cornea into the anterior chamber, at one line distance from the outer margin of the tunic: and the section may be made through the upper or the lower half of the cornea, or obliquely from above downwards.

I always prefer the latter direction, as I find less

\* Plate 16, fig. 15.

† Plate 16, fig. 16.

inconvenience from the globe rolling inwards, which is always a cause of embarrassment in the operation for cataract. In making this section, the blade of the knife should be carried in a plane parallel with the iris; and its sharp extremity should emerge again from the transparent tunic, at a point corresponding with that at which it entered. By continuing to push the instrument onwards in the direction I have described, the section is completed. Should it so happen, that the aqueous humour escapes before the knife has fairly passed through, and that the iris consequently becomes folded over its edge, (rendering a wound of that part inevitable in the event of proceeding further,) it is better to withdraw the knife at once, and complete the section with a small probe-pointed bistoury\* constructed for the purpose. Frequently when the section is completed the lens instantly escapes; but should this be prevented by the continuity of the capsule, that membrane is to be lacerated by scratching its anterior surface with the sharp point of the curette†; which should be cautiously introduced under the flap of the cornea for the purpose, great care being also taken not to get it entangled in the iris. Gentle pressure upon the globe with the spoon-shaped end of the curette now dislodges the opaque lens, and forces it through the pupil and the opening in the cornea. Thus the operation is finished; the escape of a small quantity of vitreous humour is of no consequence.

If the right eye is to be operated on, and the surgeon

\* Plate 16, fig. 17.

† Plate 16, fig. 10.

is not ambidexter, the best plan is to make an upper transverse section ; the fore and middle finger of the left hand, which fixes the patient's head, being employed in raising the upper lid, whilst the lower is depressed by an assistant. When this upper section is made, there is much less liability to subsequent prolapse of the iris, than when a transverse section is made through the lower part of the cornea ; and for many other reasons it may be considered by far the safer operation of the two.

After the operation, the patient should be kept in a cool, well-aired apartment ; light must be excluded from the eye, and every precaution be taken to prevent subsequent inflammation.

If iritis comes on, it will usually be about the fourth day ; if corneitis, and general inflammation of the external tunics, in the first forty-eight hours after the operation.

You cannot require any instruction respecting the management of the patient should such untoward consequences occur, as the proper treatment of these diseases has been already described.

#### OPERATION FOR DEPRESSION.

In some cases, where extraction is rendered extremely difficult of performance and dangerous in its consequences from the small size of the anterior chamber, adhesions of the pupil to the lens, or other causes, the operation for depression may be safely performed. The patient should be held as in cases of extraction, with the exception that moderate pressure may now be



made upon the globe to steady it. The pupillary aperture being dilated by the application of belladonna, a cataract needle\* is passed through the sclerotic immediately below the horizontal equator, at the distance of one line from its junction with the cornea: the point of the instrument is then carried between the posterior surface of the iris and the crystalline capsule, until it has passed rather beyond the centre of the pupil†; it is then directed against the fore part of the lens, which is to be pushed downwards and backwards into the vitreous humour‡. Care must be taken in this operation, not to leave the lens depressed against the ciliary processes or retina, for iritis would be the almost inevitable consequence; the occurrence of which, in an acute form, after the operation of depression, may be considered tantamount to complete destruction of the organ.

Iritis from this cause generally comes on in a few hours after the operation. The proper treatment, under such circumstances, is clearly indicated, and consists in the introduction of the needle a second time, to raise the depressed lens; but if the continued pressure of the lens against the retina or ciliary processes is not relieved, rest assured that sight will be lost. The usual remedies for iritis must be employed, should that complaint continue after the exciting cause has been removed.

The routine after-treatment of cases of cataract in which this operation has been performed, is the same as where the lens has been extracted.

\* Plate 16, fig. 14.

† Plate 15, fig. 8.

‡ Plate 15, fig. 7.

## OPERATION FOR SOLUTION.

This operation for cataract is easily performed, and, so far as my experience goes, is more satisfactory in its results than either of those I have previously described to you ; it is applicable to cases of soft, rather than of hard cataract.

Now, the lens may be brought into contact with the aqueous humour for solution, either by an anterior or posterior operation. Prior to either, the pupil should be dilated as much as possible, by applying extract of belladonna round the orbit, or a solution of belladonna to the surface of the conjunctiva. The eye being then held as in operations for extraction or depression, a needle is to be passed through the cornea for the anterior, or through the sclerotic for the posterior operation, at about the distance of a line from the junction of the tunics. In either case, whether inserted before or behind the iris, the point is to be directed to the centre of the anterior surface of the lens ; the object is then to lacerate the capsule, and bring the anterior layers of the lens (and, if very soft, the whole of the cataract,) into the anterior chamber. Care must be taken in making the attempt not to displace the lens backwards ; and the needle should be withdrawn carefully and slowly, that neither the cornea nor iris may be injured.

Several operations may be required to ensure the absorption of the lens and capsule ; but inflammation threatening the safety of the organ hardly ever follows. This operation may be performed in all cases of cata-

ract with success; it is, however, more particularly applicable to those cases where the lens is softened.

NOTE.—The great difficulty of the operation for extraction arises from the involuntary motions of the globe. In order to counteract them, the operator should place the extremity of the middle finger of that hand which commands the lid, on the globe at the inner canthus, while the movement of the globe upwards is restrained by the finger which holds the lid; thus the eye is steadied, until the point of the knife emerges from the nasal side of the cornea; when, pressure ceasing to be serviceable, and becoming hazardous, must be instantly and completely withdrawn.

If the situation recommended by the author for the section of the cornea be preferred, the operator should rigidly adhere to his intended course; otherwise this lateral section is apt to degenerate into an inferior one, and all the disadvantages attached to the latter are consequently incurred. These are, mainly, greater liability to prolapse of the iris, and its consequences—iritis, distorted pupil, &c.; greater liability to subsequent rupture of the hyaloid membrane, and escape of vitreous humour in large quantity upon some forbidden exertion, because the lower flap is destitute of the support which the superior lid affords to an upper one; protracted convalescence, owing to the greater exposure of the wounded part, and the interruption to the process of union created by the margin of the lower lid tending to insinuate itself beneath the flap, &c.

Extraction by the upper section is the most difficult of performance, but if happily completed, the prospect of continuous progress thenceforward to perfect restoration of vision is (*cæteris paribus*) much most assured. The importance of ambidexterity is great; as the surgeon situate at the patient's head is thereby enabled, on either side, himself to command the upper lid and influence the globe with the fore-finger, and



to support the globe at the inner canthus with the middle finger, of one hand; while with the other he executes the requisite manœuvres; only leaving to the assistant the care of the lower lid, from mismanagement of which, comparatively little inconvenience can arise. The knife should be made to pierce the cornea close to its junction with the sclerotic, as represented in Plate 15, Figs. 1, 2, and 4, rather than at the distance of a line from the part: greater space is thus given for the escape of the lens, and more allowance is made for the casualty of counter-puncturation not being effected precisely at the point desired. The iris having overlapped the edge of the knife, may sometimes be disengaged by gentle friction with the finger's end upon the corresponding surface of the cornea,—a resource which it is desirable to try before resorting to the small bistoury, more especially if the knife have already begun to emerge at the inner side of the cornea. A pair of fine scissors having one probe point should always be at hand, in case a wound not involving the edge of the pupil should be inflicted upon the iris; under these circumstances, by laying the wound and pupil into one aperture with the scissors, the escape of the lens (previously perhaps much impeded) takes place readily, and ulterior mischievous consequences are less likely to ensue.

## OPERATIONS FOR ARTIFICIAL PUPIL.

THE loss of vision, resulting from a closed state of the pupillary aperture, admits of remedy in many cases by the formation of an artificial opening through the iris. Various morbid conditions of the organ may render the operation for artificial pupil necessary.

Sometimes a closed pupil is congenital; but more frequently the affection arises from previous inflammatory action, by which, abnormal adhesions, or organized adhesive deposit, have been produced.

Now, previously to proposing any operation, it is proper to ascertain whether loss of vision has been occasioned by closure of the pupil only; or whether surrounding textures have also suffered materially from previous disease, and amaurosis have been the result.

It is almost always useless to operate, if there be any enlargement of the globe from *Hydrophthalmia*, or *Staphyloma* of the Sclerotic. Another objection, is a dull leaden blue discolouration round the ciliary circle, with a varicose congested state of the conjunctival vessels. The operation will again most probably be ultimately unsuccessful, if the obliterated pupil is accompanied by permanent dulness and discolouration of the iris; for the previous inflammation producing this change occasions likewise impairment of the functions of the retina.

Lastly, should the patient be unable to distinguish light from darkness, you may rest assured that amaurosis is present.

If the iris preserves its normal colour and brilliancy, and the form and general condition of the globe appear to be healthy, the following operations may be performed.

OPERATIONS.—An artificial aperture may be made for the purpose of permitting the rays of light to pass to the retina, either by incision through the iris, by excising a portion of it, or by forcibly tearing through its fibres.

1. In the operation for incision,\* a needle with cutting edges is passed through the sclerotic coat, at about the distance of a line from its junction with the cornea; and the point having punctured the iris, and entered the anterior chamber, is carried more than half across that cavity; by a succession of motions, an incised wound is then made through the iris, with the cutting edge of the instrument, and the divided fibres separating, leave an inlet for the passage of light to the retina. Belladonna should be applied after this operation, to keep asunder the margins of the wound, which, notwithstanding, frequently reunite; hence a second or third operation may be required, and the result be, even then, very unsatisfactory.

An extremely small knife has been used and recommended for this operation, instead of a needle: the latter, however, is to be preferred.

Another mode of performing this operation consists in making, with a cataract knife, an opening in the cornea large enough to allow the blades of a very fine

\* Plate 17, fig. 6.



pair of scissors\* to be introduced ; an incision is made by the closure of these, after one has been passed through the iris.

2. The operation for laceration is more particularly applicable to those cases where a large central opacity of the cornea is the cause of blindness. An artificial pupil must, then, of course be made in the circumference of the iris ; and this is effected by tearing a portion away from its ciliary attachment, as shown in Plate 17, fig. 5.

A needle bent at the point (commonly called Scarpa's needle,†) is made to penetrate the cornea near its junction with the sclerotic, and having been passed through the anterior chamber to the opposite side, the point is directed backwards through the iris, which is then carefully separated by laceration from its ciliary connections.

3. The operation of excision is accomplished by making, with a cataract knife, a section or rather puncture through the cornea sufficiently large to admit the introduction of a pair of fine double hooks or forceps,‡ by which a portion of the iris can be drawn out through the aperture, and be excised with scissors. Sometimes the iris partially prolapses as soon as the opening has been made in the cornea ; in which case the introduction of forceps or double hooks into the anterior chamber is unnecessary, as the prolapsed portion can be readily seized at the surface of the transparent tunic.

The same precautionary measures are requisite to

\* Plate 16, fig. 9.

† Plate 16, fig. 13.

‡ Plate 16, fig. 1.

insure success after an operation for artificial pupil, as in cases of cataract.

NOTE.—The detrimental effect of mere central opacity of the cornea may often be eluded without operation, by the daily use of a solution of belladonna or of atropine, as a collyrium. In such cases, of course no operation is justifiable. But when the opacity remains indelibly fixed, notwithstanding the patient use of local applications intended to promote its removal; and where dilating the pupil does not suffice to re-establish a useful degree of vision, operative interference is clearly indicated, provided the sight of the other eye be lost. Under such circumstances the transparent part of the cornea may be brought opposite the pupil, by dividing one of the recti, and so creating strabismus, or, by means of a fine blunt hook introduced through a puncture. The pupil may be drawn to the transparent circumference of the cornea; and be retained at its new situation by partial entanglement in the aperture. Neither operation is open to the serious objection of involving the destruction of a healthy lens and capsule.

But in cases of synechia posterior and opaque capsule, (with or without partial opacity of the cornea,) an operation for artificial pupil may be required, and interference with the lens is then unavoidable; hence its immediate extraction, or its ultimate removal by solution, is essential to success. In such cases simple division of the iris is not applicable; nor indeed in any, where there does not obviously exist a considerable degree of tension upon the fibres of the iris. Complete directions, as to the particular modification of operation for artificial pupil adapted to different cases, might occupy a volume, so infinitely various are the precise circumstances rendering one necessary; but the fundamental principles being understood, the selection must be left in the main to the extemporaneous judgment and ingenuity of the surgeon.

## ENTROPEON AND ECTROPEON.

AN operation is sometimes required for the removal of deformity and disease occasioned by an inverted or everted state of the eyelids : the former state is called Entropeon, the latter Ectropeon.

ENTROPEON is accompanied by inversion of the eyelashes against the globe,—an affection called Trichiasis, which, together with the pressure of the inverted lid, produces continual irritation and inflammation on the surface of the eye. When the disease is of long standing, surgical interference becomes necessary for the relief of the patient. In cases where the inversion is not very great, the operation consists in division of the tarsal cartilage at the outer canthus, the divided parts being kept separate during the healing process : but to insure a permanent and radical cure in the severest chronic forms of the complaint, either the whole cartilage must be excised, or a flap must be made by two vertical sections through the lid, and this flap be kept everted, (by means of threads passed through its edges, and attached by plaister to the adjacent integuments), long enough to prevent union by adhesion. A minute description and delineation of the mode of performing this very simple operation, the suggestion of Mr. Guthrie, will be found in that gentleman's work on diseases of the eye. I have succeeded with it in some cases remarkably well ; but in others have failed, and



been obliged to excise the whole cartilage afterwards : this latter operation, therefore, I now generally do, when the disease is in the most aggravated form, and has been of long continuance.

It has been recommended to remove a portion of integument from the lid, and afterwards bring the divided edges of the wound together, so as to draw the cartilage into its natural situation ; but I have generally found the advantage derived from this plan of treatment only temporary. The same may be said, for the most part, of the application of caustic to the integument of the lid, with the view of forming a cicatrix, and thus producing contraction of the surrounding soft parts.

ECTROPEON is met with both as a temporary and permanent affection.

Temporary Ectropeon results from inflammation of the conjunctiva and cellular connections of the lid, producing swelling of the membrane, and eversion of the tarsal cartilage in consequence. I have already described the diseases in which you will meet with it : of these, purulent ophthalmia is the most common ; and by removing the original disease, any necessity for operation is prevented.

But there is generally some difficulty in relieving permanent Ectropeon. The eversion is usually produced by cicatrices ; and it might appear that their removal, which in most cases allows the lid to be immediately brought up, would easily effect a perma-

ment cure ; it is found, however, that subsequent contraction almost always takes place. Something further, therefore, is commonly required ; although removal of the cicatrix and adhesions to deep-seated parts must always be the first step in the operation.

More effectual relief may be given in two ways ; first, by cutting out with the cicatrix a central triangular portion of cartilage (the base of the triangle being at the edge of the lid), and bringing the parts together afterwards by suture. The wound occasioned by the removal of the cicatrix must then be prevented from healing by adhesion, lest the adhesive process in the cut edges of the cartilage should be disturbed by contraction at that situation : this operation is only applicable where eversion is slight.

In the worst cases of Ectropeon, mere removal of the cicatrix, whether combined with excision of a triangular portion of cartilage or not (and such excision is generally necessary when the cartilage is permanently misshapen by long eversion), will not suffice. To accomplish a perfect cure, a portion of continuous integument must be patched upon the gaping surface created by the removal of the cicatrix ; and by this Taliacotian operation I have not, to my recollection, failed in curing the deformity in any remediable case. The partially detached portion of skin is to be confined in its new situation by small platinum sutures, and a light bread and water poultice should be used as a dressing. If the sutures are properly applied, it rarely happens that more than one small strip of adhesive plaister is required under the poultice to assist

in keeping the transposed integument in its place ; and sometimes a poultice is the only dressing necessary.

This operation being a severe one, few patients are inclined to submit to it, unless the deformity and inconvenience of the ectropeon are very great : but it is the only means of accomplishing a perfect and radical cure, with which I am acquainted, in the worst forms of the disease.



## MORBID AFFECTIONS OF THE LACRYMAL CONDUITS.

THE lacrymal conduits consist, as you know, of the puncta lacrymalia and canaliculi, the sac, and the nasal duct. Now the principal deviations from the healthy condition of these parts arise from inflammation; by which, abscess in the lacrymal sac and continuous structures, or closure of the puncta, or stricture of the nasal duct, is produced.

Closure of the puncta, from whatever cause, is to be removed by passing a sharp-pointed instrument (a pin answers the purpose better than any other) perpendicularly downwards in the lower lid, and upwards in the upper one, into the orifice of the punctum; but no further: a very fine punctum probe\* is then to be introduced, and carried in the same direction, for about a line, when, by turning the instrument horizontally inwards, it may be easily pushed through the lacrymal duct into the sac, and thus a free passage for the tears be opened. Unless there are some indications of altered structure external to the lacrymal duct, capable of creating obstruction in it, the impediment to the passage of the tears into the sac occasioning epiphora will always be found in the punctum; for stricture in the lacrymal duct never arises as an idiopathic affection.

\* Plate 16, fig. 4.

By performing the operation I have just described a few times, and promoting the healthy state of the conjunctiva, you may afford entire relief ; but, from various causes, the complaint is liable to recur.

**FISTULA LACRYMALIS.**—Diseases of the lacrymal sac occur in combination with a morbid condition of the lining membrane of the nasal duct ; which is, I believe, the most frequent source of the complaints to which the sac is subject. The only diseases you are likely to meet with in practice result from common inflammation, generally occasioned by the irritation of a morbid lacrymal secretion ; which, acting upon the continuous mucous membrane of the sac and duct, excites thickening of that membrane and its surrounding investments, and so causes obstruction at the narrow part where the nasal division of the conduit commences in its bony canal. Distension of the sac follows, at first owing to accumulation of lacrymal fluid, but afterwards produced by purulent effusion from the lining membrane of the sac ; discolouration soon shows itself on the superjacent integuments ; the abscess bursts ; and the tears passing continually through the opening, a disease called fistula lacrymalis is established. This complaint, then, involves both the sac and duct ; the former being the seat of suppurative inflammation, the latter of stricture.

The treatment consists in establishing a free outlet for the contents of the sac, and lessening inflammation in surrounding parts. Leeches are often required, and a light bread and water poultice is the most grateful application, during the acute stage : as soon as pus has

formed, an opening should be made with a lancet for its evacuation, and a probe be passed through the sac and nasal duct into the nose ; but if the contents of an inflamed and distended sac, when pressed through the puncta, present no evidence of suppuration, dilatation of the obstructed duct will probably render any other operation unnecessary.

There are two modes of dilating a strictured nasal duct without making a wound in the face : the first, recommended, and, I believe, first practised by Mr. Travers, consists in passing a punctum probe through the lacrymal duct fairly into the sac, and thence almost directly downwards into the nose, thus clearing a small channel for the passage of the secretions from above. Mr. Travers also recommends injections introduced through the puncta by means of Anel's fine syringe tubes\*. My own mode consists in passing a curved probe† upwards through the nasal duct ; an operation which, although requiring a little practice to perform it with facility, is, so far as my experience has gone, most satisfactory in its result. No force must be used in introducing the instrument ; but the point, after being carried under the inferior turbinated bone, is to be carefully inserted in the lower opening of the duct, and then gently pushed upwards through the stricture, by depressing the handle while keeping the convex part next the handle upwards.

After having thus established a free passage into the sac from below, I generally inject tepid water from day

\* Plate 16, fig. 2, 3, and 7.

† Plate 16, fig. 12.



to day, by means of a small catheter, introduced in the same manner as the sound \*, and attached to an Anel's syringe†. By following this plan, suppuration may sometimes be prevented; and a fistulous opening in the face is avoided, if the disease be confined to the lining membrane of the sac, although matter may have formed within it; for accumulation there is prevented by the frequent injections.

Epiphora, accompanied by inflammation of the sac, is not uncommon in strumous children; but attention to the general health, and the use of means adapted to lessen any surrounding inflammation, together with mild astringent collyria, will generally cure the disease. The exciting cause in these cases is temporary obstruction in the nasal duct from morbid lacrymal secretion, accompanied by slight thickening of the lining membrane of the duct itself.

A style, or metallic pin‡, is recommended by some, as useful for the cure of lacrymal obstruction; it is introduced through an opening made in the sac, and is worn in the nasal duct; the button head rests on the face, and, of course, prevents the instrument slipping down into the nose.

I never adopt this plan of treatment, for I consider my own and Mr. Travers's much better, both in principle and practice.

Perhaps, before concluding, I ought to mention a relaxed state of the puncta, by which they are increased

\* Plate 16, fig. 11.

† Fig. 6.

‡ Plate 16, fig. 8.

in size, rendered patulous, and disabled from insuring the passage of the tears into the sac. The treatment of relaxation of the puncta occasioning watery eye, or epiphora, consists simply in the application of astringent collyria.

In these Lectures on Diseases of the Eye, it is not my intention to describe the effects of mechanical violence upon the organ of vision and its appendages ; for, when ophthalmic and general surgery are recognized as one science, this subject will be comprised in ordinary lectures on wounds and contusions. For a similar reason, to enter into a description of the tumours formed in the lids, and of the mode of operating upon them, would be needless ; as tumours of the same kind are met with in analogous structures in all parts of the body, and are described to you in the course of the surgical lectures of which these form part.

Whatever further information or illustrations, therefore, gentlemen, you require on the subject of Ophthalmic Surgery, will be afforded during the practical study of your profession in the Eye Infirmary attached to this Hospital.

## CONCLUSION.

THE Editor cannot better close the present volume, than with the following eloquent and truthful passage from the *Observationes Medicæ* of Sydenham :—

“ Qui Medicinæ dat operam, hæc secum ut serio perpendat oportet. Primo, se de ægrorum vita ipsius curæ commissa rationem aliquando Supremo Judici redditurum. Deinde, quicquid artis aut scientiæ Divino beneficio consecutus est, imprimis ad Summi Numinis laudem atque humani generis salutem esse dirigendum; indignum autem esse ut cœlestia illa dona vel avaritiæ vel ambitus studio inserviant. Porro, se non ignobilis alicujus aut contemnendi animalis curam suscepisse: ut enim humani generis pretium agnoscas, Unigenitus Dei Filius homo factus est, adeoque naturam assumptam Sua dignatione nobilitavit. Denique, nec se communi sorte exemptum esse, sed iisdem legibus mortalitatis, iisdem casibus et ærumnis obnoxium atque expositum, quibus alii quilibet; quo diligentius, et quidem teneriori cum affectu, ipse plane *ὁμοιοπαθῆς* ægrotantibus opem ferre conetur.”

THE END.





## PLATE I.

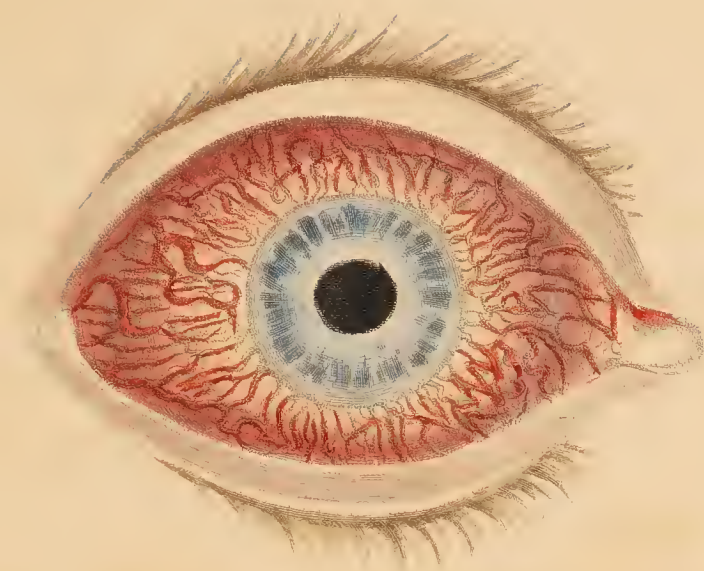
FIG. 1.—Acute inflammation of the conjunctiva, showing the scarlet appearance of the tortuous vessels of the membrane, always distinctly seen previous to, and sometimes after, the accession of acute inflammatory chemosis, shown in PLATE 13, Fig. 1. This morbid condition of the part accompanies, more or less, most of those diseases of the external tunics comprised by some under the general term of ophthalmia, but noticed separately in these Lectures, in the descriptions of the various diseases connected with conjunctivitis.

FIG. 2.—Apthous or pustular inflammation of the conjunctiva, with diffused inflammation of the whole of the membrane covering the sclerotic ; the apthæ, it will be observed, are of comparatively small size, as in almost all cases where a considerable number form at the same time.

FIG. 3.—Chronic apthous inflammation of the conjunctiva. It will be obvious that the assistance of a magnifying glass must be necessary to show the appearances here represented, as well, indeed, as those delineated in Fig. 2 ; for they are both rough diagrams, which I have, however, thought more explanatory than highly finished drawings.

In this diagram only two apthæ appear to have formed, which are of large size ; this is frequently the case when they are not very numerous, and are unaccompanied by diffused acute inflammation of the conjunctiva.

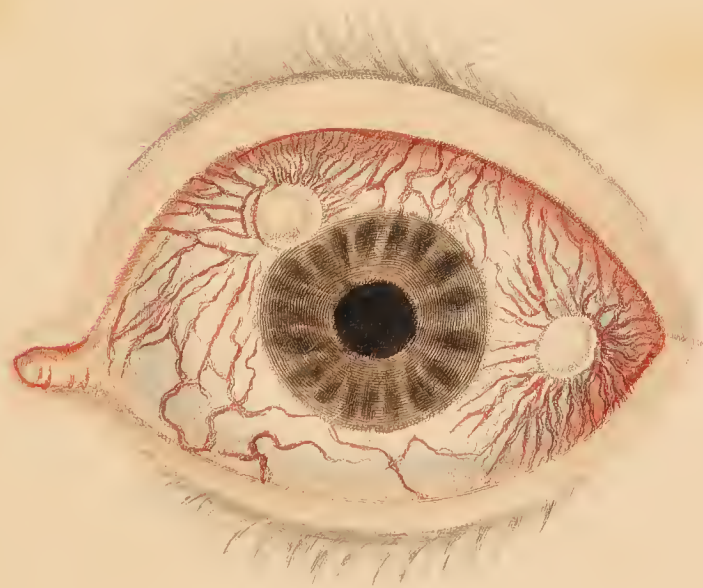
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## PLATE II.

FIG. 1.—Inflammation of the cornea, as seen most frequently in those who have suffered from uncontrolled strumous ophthalmia. The reddened circle surrounding the opaque cornea arises from an altered condition of the conjunctival vessels, which are usually slightly raised, as they overshoot the margin of the formerly transparent tunic. Acute conjunctivitis does not always accompany this form of disease.

FIG. 2.—This diagram shows the effects of mechanical pressure upon the globe, either from a granular state of the conjunctiva of the lids; or (as in rare cases) from undue contraction of the fibres of the orbicularis palpebrarum, owing to morbid action in some distant part. Chronic conjunctivitis is here seen combined with a hazed condition of the cornea, which is marked or streaked by numerous conjunctival vessels carrying red blood, the greater number of which are situated on the upper part of the globe, where the eyelid makes most pressure. The term Pannus has been given to this complaint, and Vascular Cornea is its common designation.

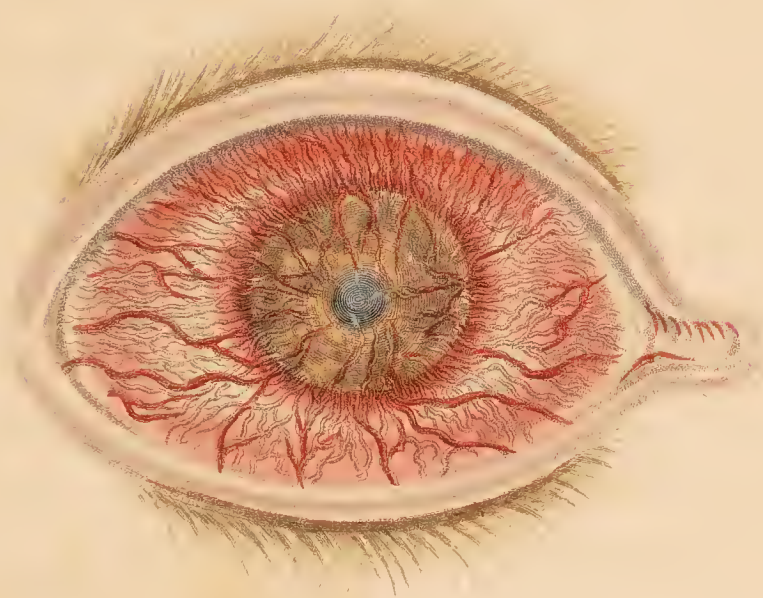
FIG. 3.—Prolapse of the iris; a portion of the membrane having been pushed through the lower part of the cornea, the aperture in which is surrounded by a whitened haze of inflammation: the turgid state of the conjunctival vessels here represented, in most cases accompanies prolapsus iridis, until the process of redress has been completed.



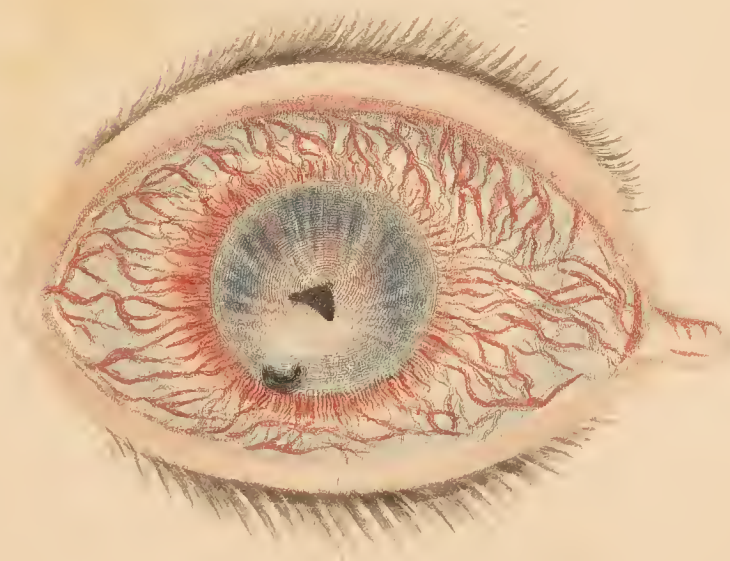
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### PLATE III.

FIG. 1.—Represents a granular state of the conjunctiva of the upper lid, with the first effects of its pressure upon the globe; the inflammation occasioned by that pressure being indicated by the reddened appearance of the subjacent conjunctiva, and the haze of the upper part of the surface of the cornea.

FIG. 2.—A very rough diagram of the peculiar form of inflammation shown in Fig. 1; that inflammation is always vesicular; and the surface of the cornea, from the bursting of the vesicles, assumes a scabrous appearance, and becomes hazed around and beneath its injured surface, as is here represented; sometimes, however, the cornea nearly retains its transparency.

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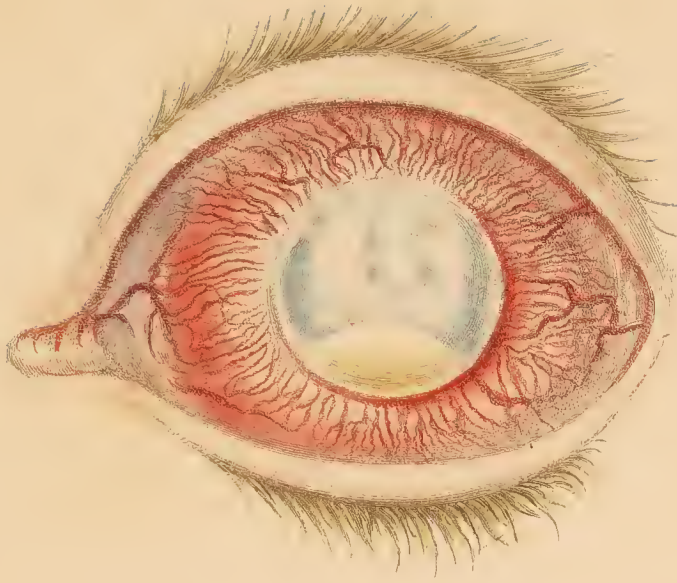
## PLATE IV.

FIG. 1. — Hypopyon, or, as it has sometimes been called, Unguis, with inflamed conjunctiva and cornea. In the posterior laminae of the cornea will be seen circumscribed opaque spots indicating the situation of abscesses, from the bursting of which the purulent effusion has gravitated to the lower part of the anterior chamber, and produced the appearance called hypopyon. The opaque spots in the transparent cornea, whether of recent formation or remaining after active disease has subsided, are generally known under the name of onyx.

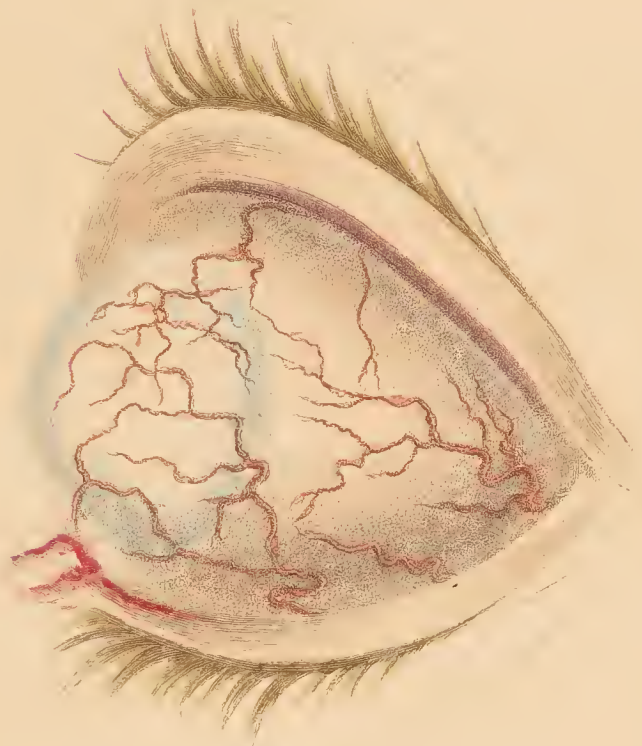
FIG. 2.—Staphyloma of the Cornea.

FIG. 3. — Abscess of the globe, accompanied by acute inflammatory chemosis and disorganized cornea.

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## PLATE V.

FIG. 1.—Abscess of the globe, with a dark-coloured slough of the cornea, accompanied, as this disease always is, by inflammatory chemosis.

FIG. 2.—Diffused staphyloma of the sclerotic, symptomatic of choroiditis, as well as of some other morbid affections of the external tunics.

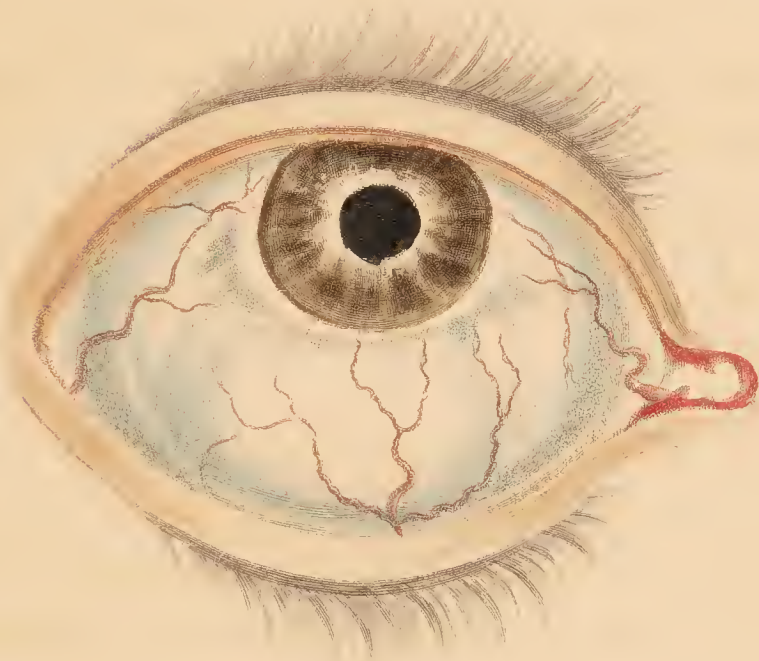
FIG. 3.—Melanosis, as contrasted with Fig. 1. It will be seen, that a slough has here also taken place in the fore part of the globe; but the distinction in the appearance of surrounding parts will be obvious, on comparing the two diagrams.



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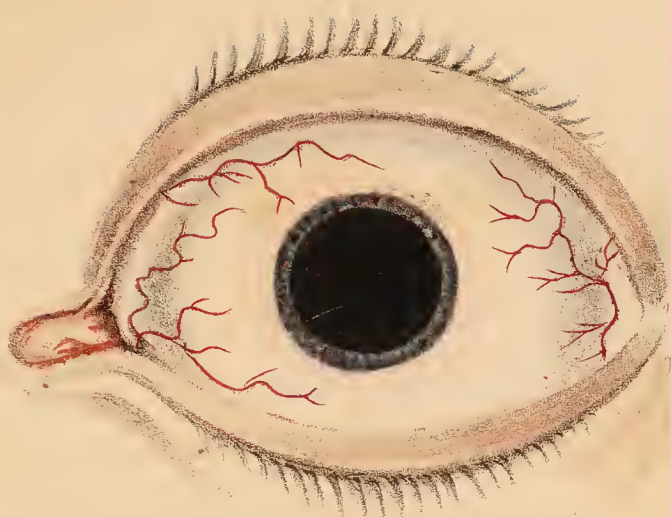
## PLATE VI.

FIG. 1.—Incipient retinitis, with widely dilated pupil and the first blush of inflammation in the sclerotic coat where that part encircles the transparent cornea.

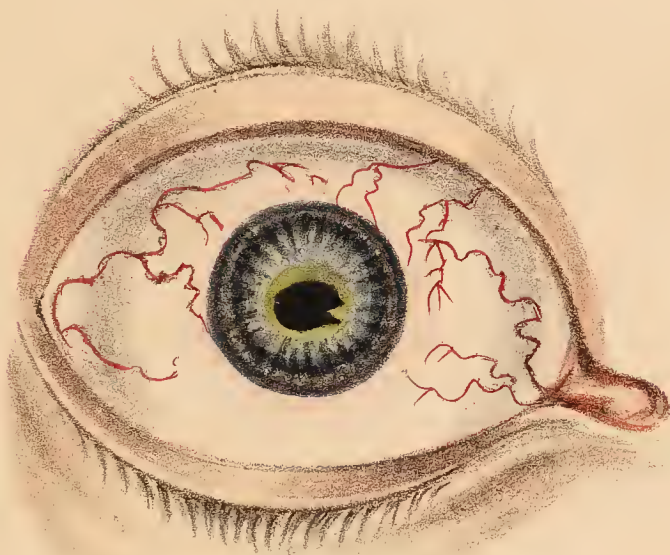
FIG. 2.—Incipient iritis, previous to the accession of conjunctivitis. It will be seen that a pink zone encircles the circumference of the cornea, the pupil being irregular from recent adhesions to the capsule of the crystalline lens. The first appearance of discolouration in the iris is shown at the central part around the pupillary aperture.

FIG. 3.—Iritis in a more advanced stage; the whole of the iris discoloured, its bright radiated appearance entirely obscured; the pink zone in the sclerotic coat increased; a patch of lymph poured out upon the lower and anterior part of the iris, together with a small portion of pus, the precursor of Hypopyon.

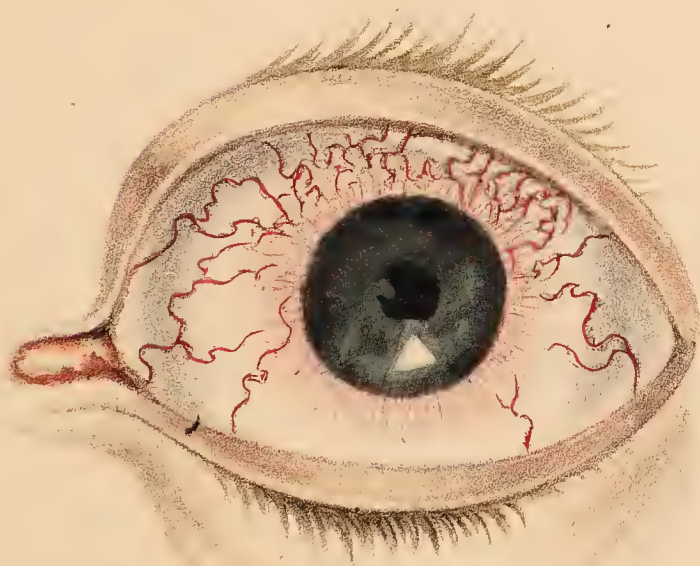
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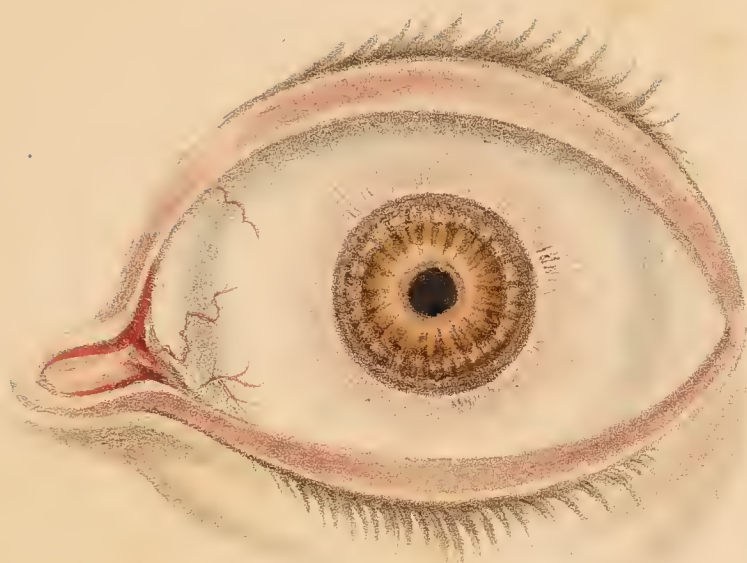
## PLATE VII.

FIG. 1.—Acute diffused inflammation of the sclerotic, with contracted pupil, the cornea remaining unaffected.

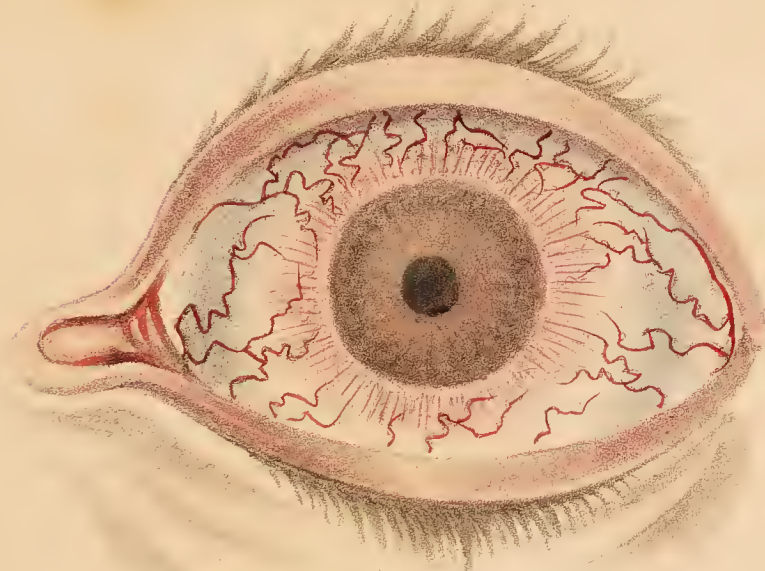
FIG. 2.—Haze of the cornea, with slight inflammation of the iris, accompanied by a pink sclerotic zone.

FIG. 3.—Chronic scleritis. It will be seen that the zone is here of a somewhat purple colour, and that the vessels in the sclerotic, radiating from the point of its junction with the cornea, are imperceptible from their extreme minuteness; the discolouration appears like a stain on the part. The iris has recovered its brilliancy; and it can hardly be said that any tunic but the sclerotic is visibly affected; this is congestive inflammation, and requires an alterative and tonic plan of treatment. This complaint is often mistaken for Iritis.

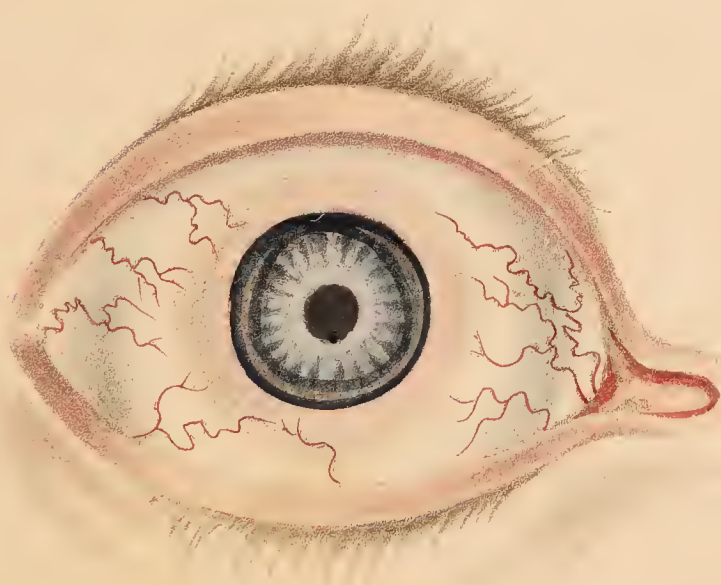
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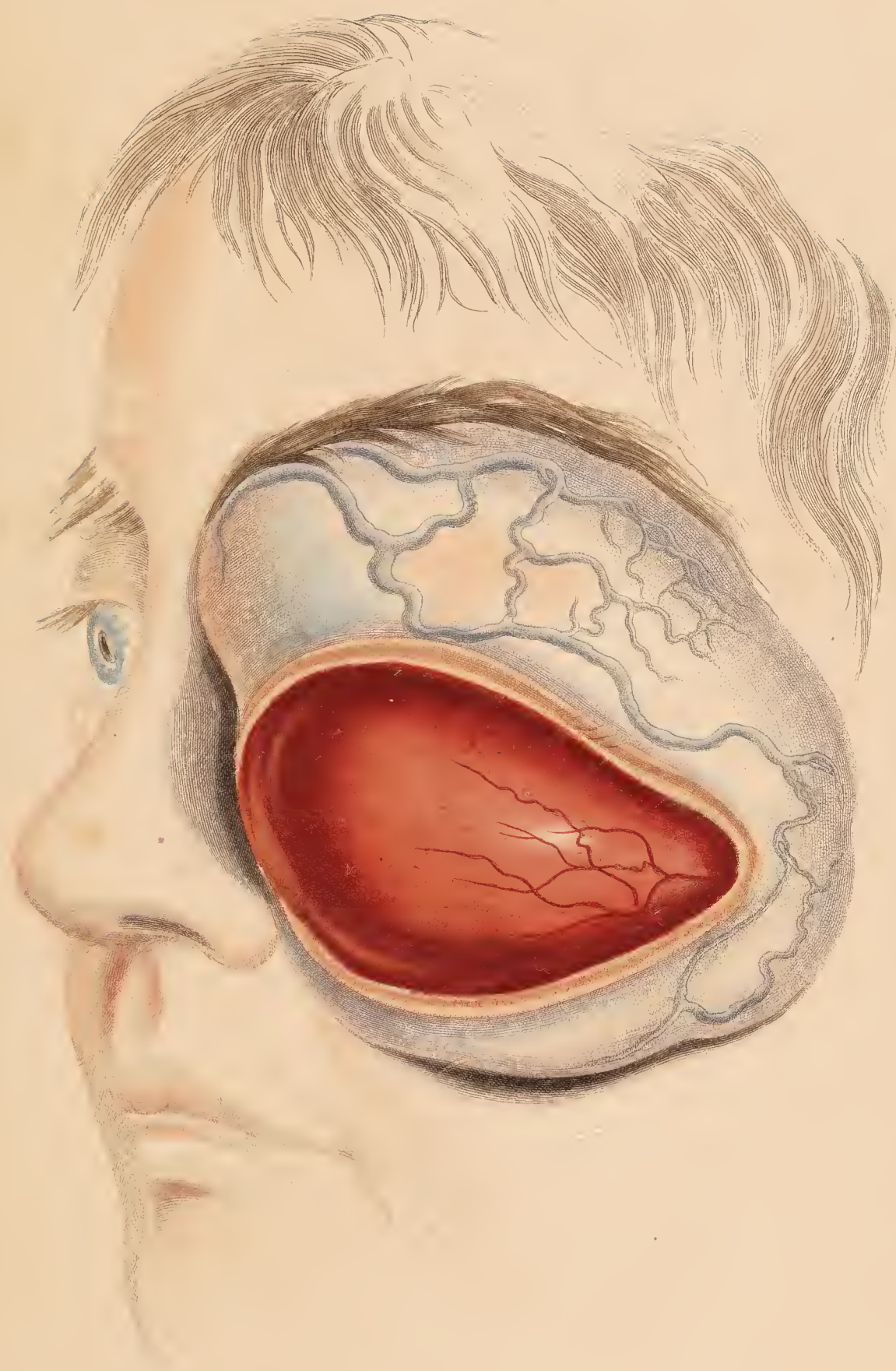




## PLATE VIII.

Fungus hæmatodes of the globe. The drawing was taken from a patient in whom the disease had existed twelve years.











## PLATE IX.

FIG. 1.—The termination of the disease represented in Plate VIII. The patient died sixteen years after its first appearance.

FIG. 2.—Appearance of the orbit after the removal of the tumour after death. The disease had found its way through a carious aperture in the orbitar plate of the frontal bone to the brain; the enlarged orbitar cavity was formed by an adventitious bony deposit.

Fig. 1.

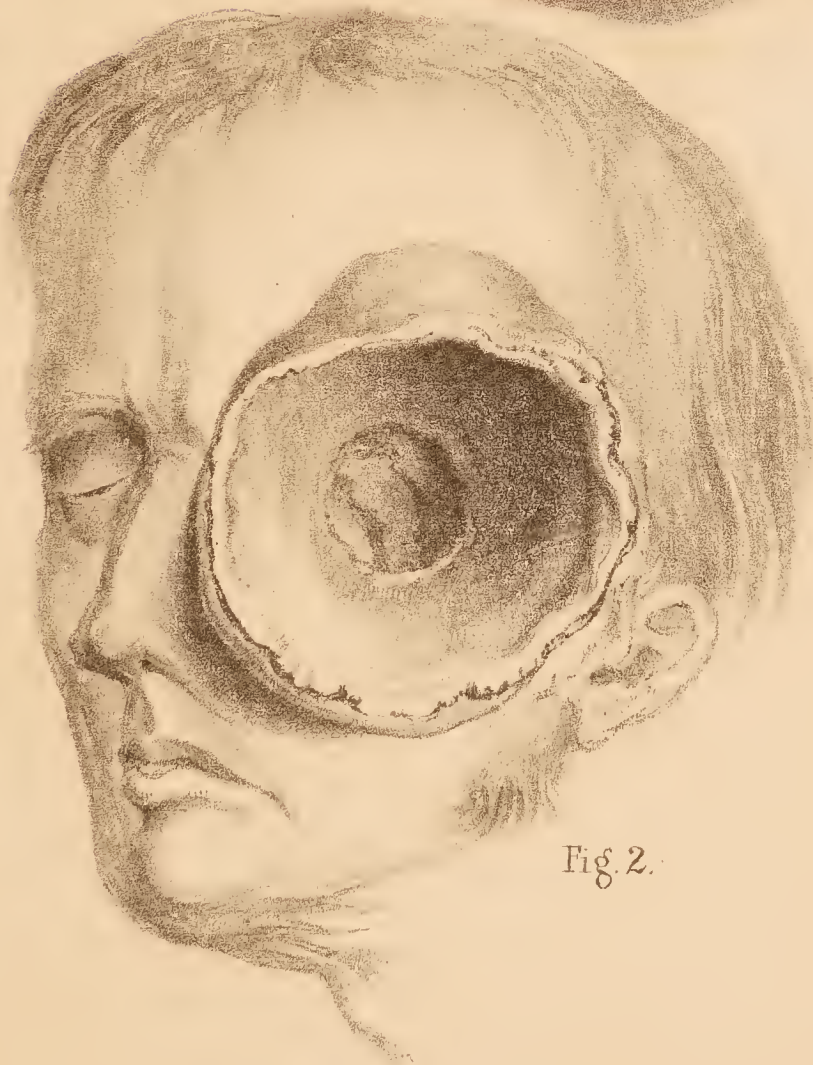
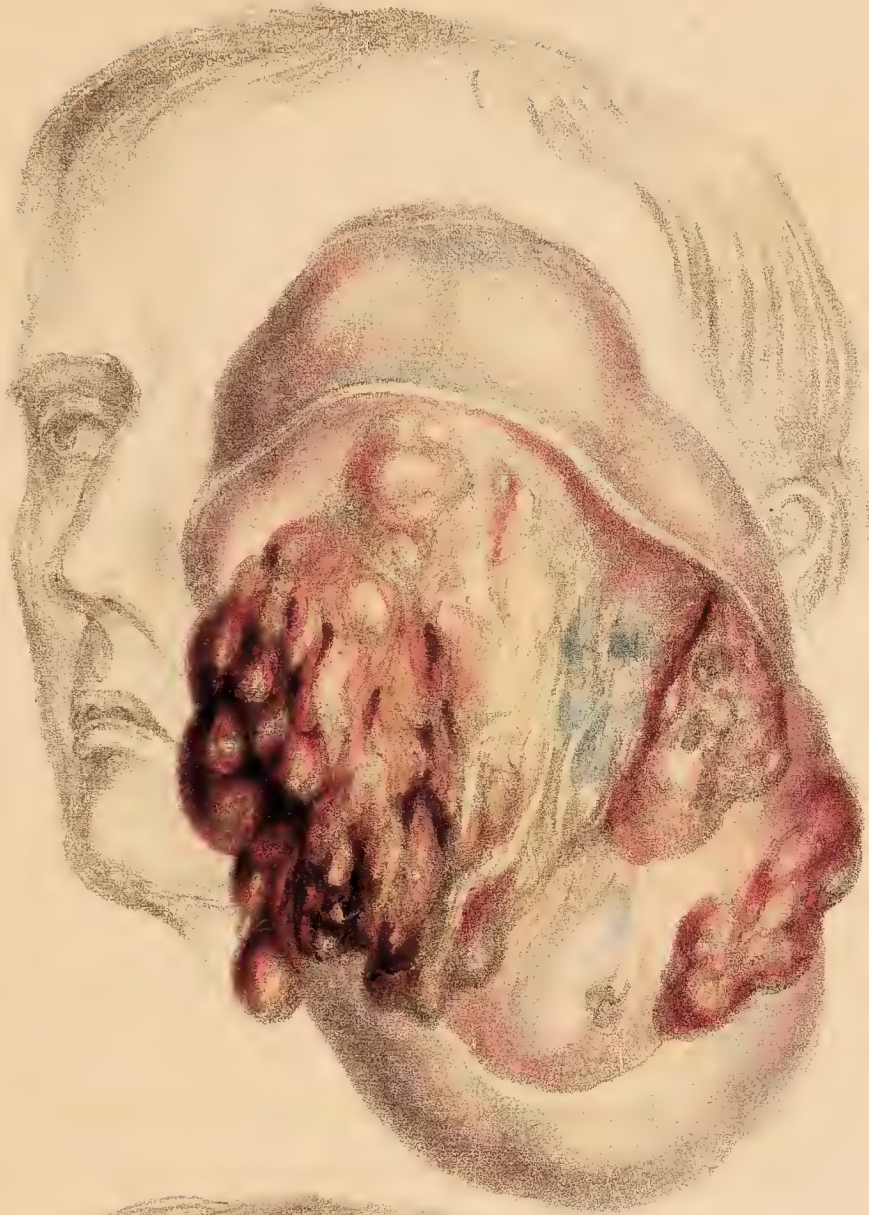


Fig. 2.







## PLATE X.

FIG. 1.—Melanosis affecting the globe and lids.

FIGS. 2, 3, and 4.—Sections of eyes, affected with malignant disease, illustrating Dr. Hodgkin's discovery relative to the formation of serous cysts, as the origin of cancerous, fungoid, and melanotic diseases.



Fig. 2.



Fig 3.



Fig 4









## PLATE XI.

FIG. 1.—Fungus hæmatodes in its earliest stage ; the dilated pupillary aperture presenting a bright metallic appearance ; a small deep-seated fungoid tubercle, with minute over-shooting red vessels, making its appearance in the posterior part of the globe ; a very slight leaden discolouration becoming perceptible on the anterior part of the sclerotic.

FIG. 2.—Staphyloma racemosum ; a disease not of malignant character, affecting the external surface of the eye only, and leaving the interior of the globe free from disease.

FIG. 3.—Glaucoma ; often mistaken for cataract, but easily distinguished by diagnostic marks described in the course of the work : the difference will be seen strongly represented in Plate 14, figs. 1, 2, and 3.



Fig. 1.

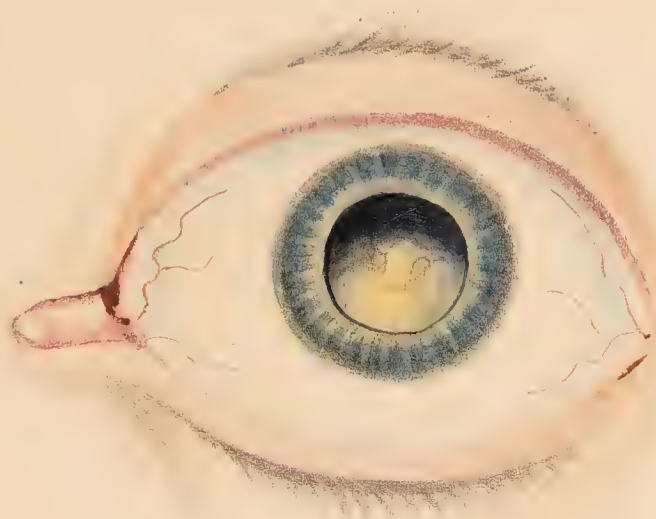


Fig. 2.

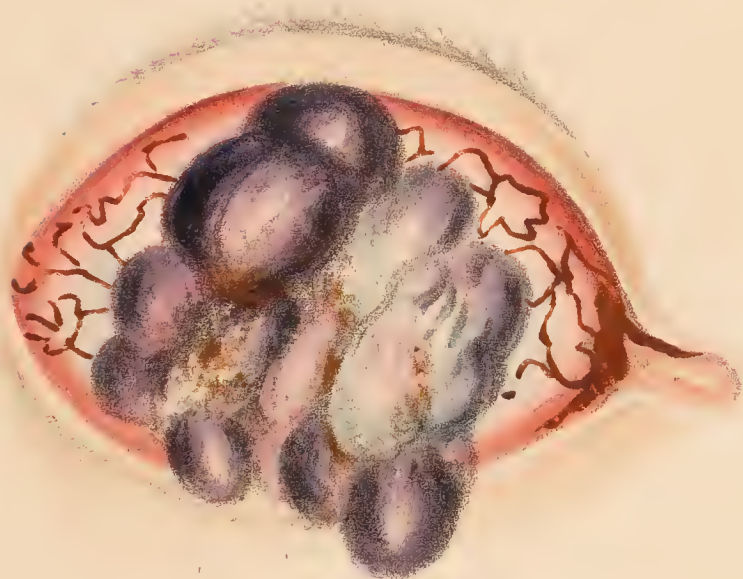


Fig. 3.

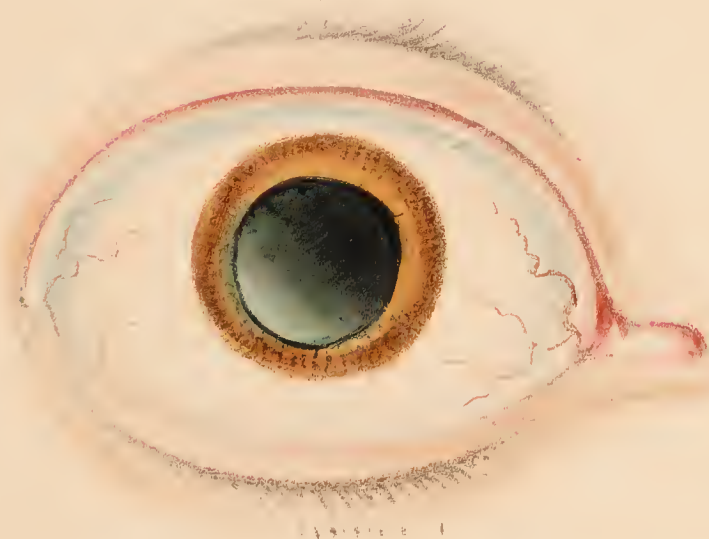








PLATE XII.

Enormously swollen and inflamed lids of a child, the subject of purulent ophthalmia.







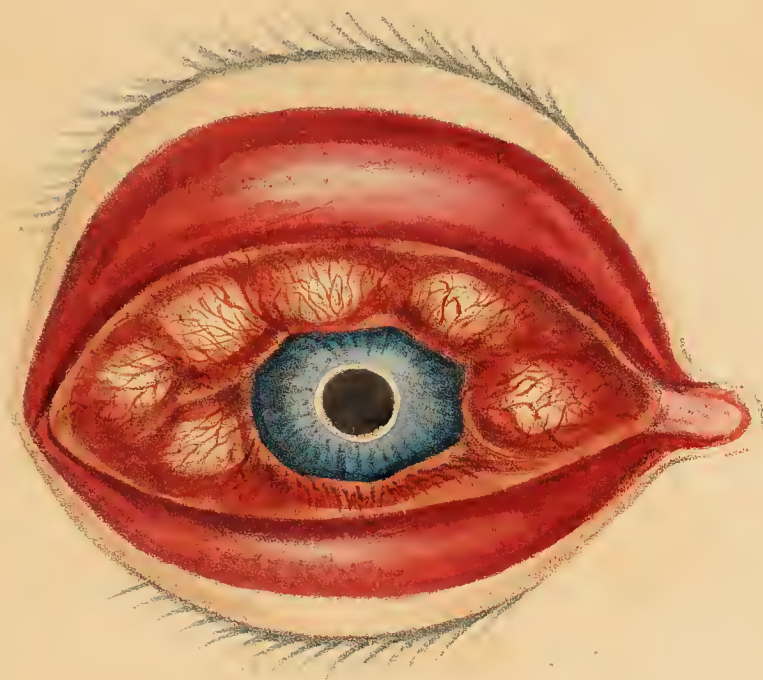


### PLATE XIII.

FIG. 1.—Inflammatory chemosis; the conjunctiva lining the lids and covering the sclerotic swollen and highly reddened; the conjunctiva scleroticæ bagging over the still transparent cornea, which it partly conceals: this condition is met with as a consequence of several diseases.

FIG. 2.—Transparent depression of the cornea, (always seen best by taking a side view of the part,) indicating the situation of an inflamed ulcer.

FIG. 3.—Ulcer of the cornea, which at one spot has nearly penetrated through the coat. In the bottom of the ulcer will be seen a minute vesicular projection, occasioned by the protrusion of the membrane of the aqueous humour, which retains an extremely thin covering from the posterior layers of the cornea.



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*Drawn on Zinc by T. Fairland.*

*Printed by J. Grieco, Nicholas Lane.*







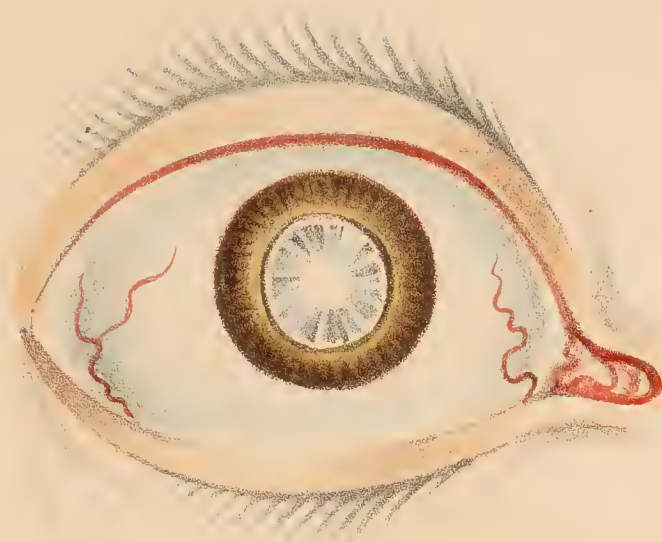
## PLATE XIV.

FIG. 1.—Capsulo-lenticular cataract; the talc-like radiated circumference of the capsule contrasting with the central opacity of the lens.

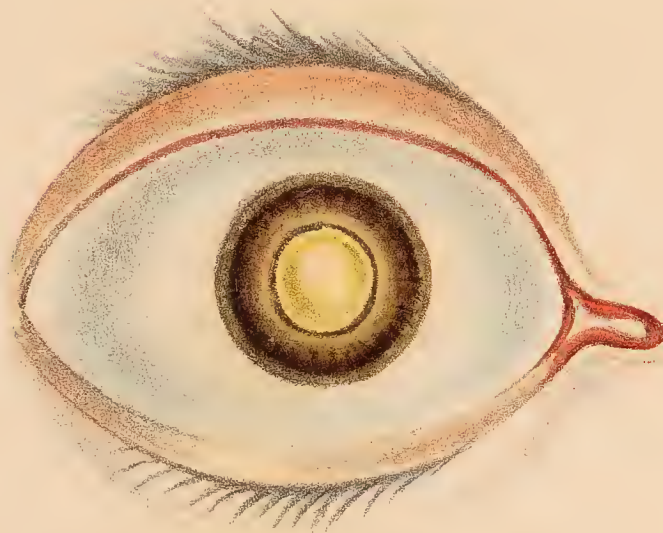
FIG. 2.—Soft cataract, showing the effect which enlarged lens produces by pressure upon the posterior surface of the iris; the uvea being rendered remarkably conspicuous, from being pushed over the margin of the pupillary aperture.

FIG. 3.—Central and perfectly opaque capsular cataract, most frequently met with as a congenital affection, or a consequence of wound or injury.

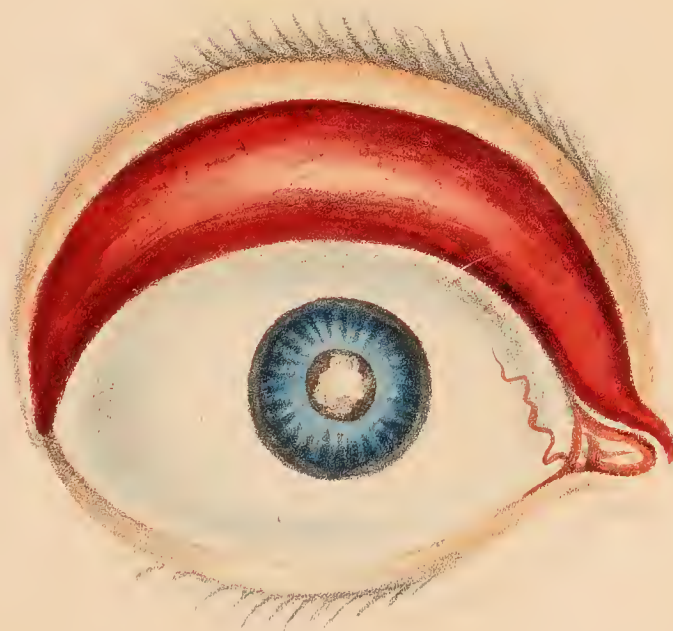




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## PLATE XV.

Is intended to represent the steps of the usual operations for cataract. In the two first figures, the knife (Wenzels') is passed through the cornea obliquely from above downwards. In Fig. 1, the point of the instrument has just entered the anterior chamber. In Fig. 2, the section is completed. Should the attempt at making the section as here delineated be prevented, and it be necessary to enlarge an opening which has been made too small for the passage of the lens, the best proceeding consists in completing the section with an extremely small probe-pointed and curved bistoury. This process is exhibited in Fig. 3.

FIG. 4.—Transverse section of the cornea performed with Beer's knife.

FIG. 5.—Represents the mode of lacerating the Capsule of the Lens, by means of the finely pointed curved end of the curette, after the section has been completed.

FIG. 6.—Operation for solution; the lens soft, and speckled; the needle passed through the cornea, and its point carried through the centre of the pupillary aperture, for the purpose of cutting up the capsule of the lens and its anterior laminae, without depressing the opaque body.

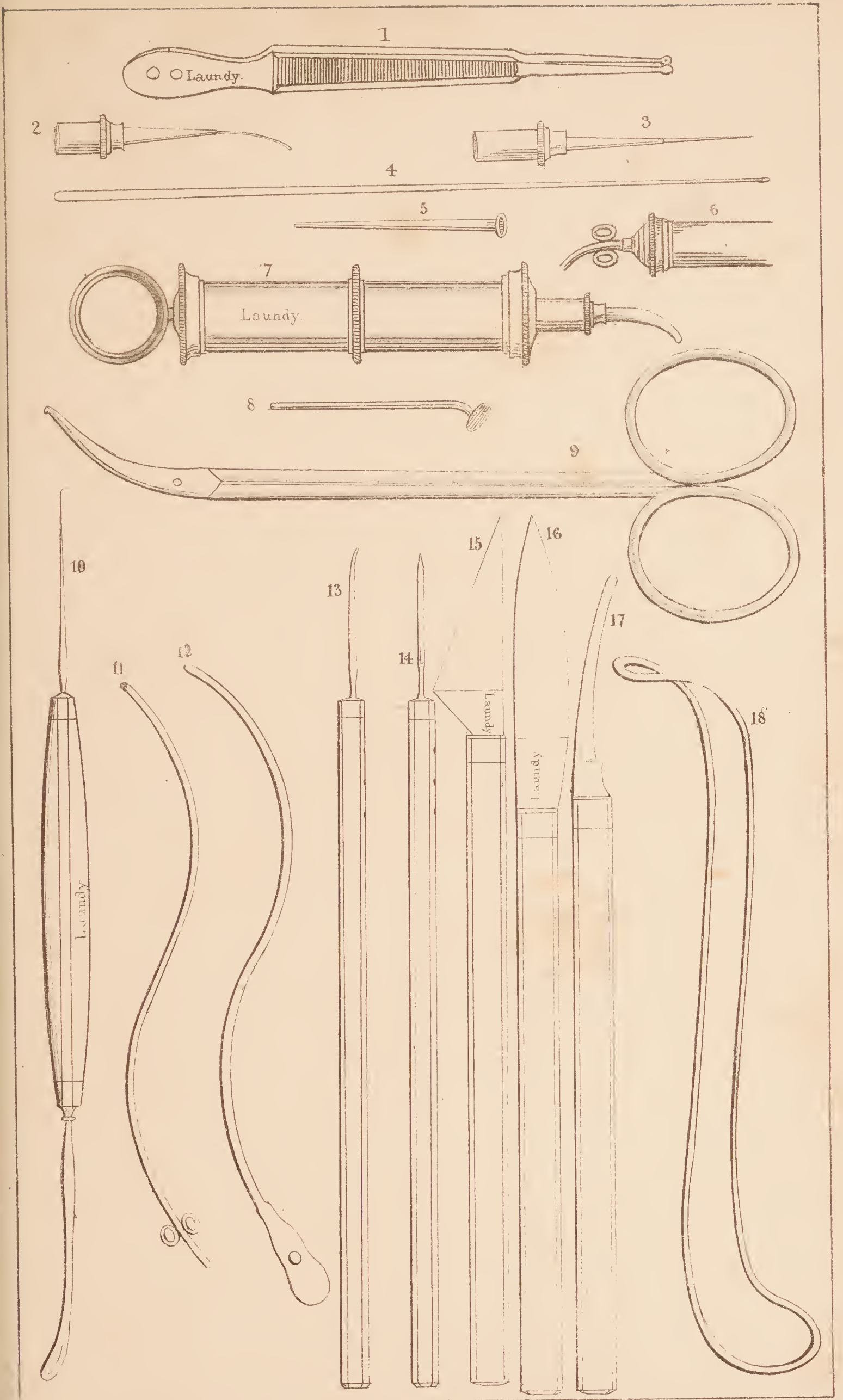
FIG. 7 and 8.—Operation for depression. In Fig. 8, the first step of the operation is shown, viz., the passage of the needle through the sclerotic; its point has been carried behind the Iris, and is seen in the centre of the pupillary aperture. In Fig. 7, the point of the instrument has been moved downwards and backwards, carrying with it the opaque and dislodged lens. [Even making allowance for fore-shortening, the artist has represented the point of the needle's entrance in both these figures considerably too close to the edge of the cornea. See pp. 206 and 208.]



## PLATE XVI.

Instruments used in different operations on the Eye. It is not considered necessary to give a detailed description of them, as they are referred to severally in the Lectures on Operative Ophthalmic Surgery.











## PLATE XVII.

FIGS. 1 and 2.—The appearances of Sclerotic and Conjunctival Inflammation contrasted.

FIGS. 3 and 4.—Diagrams explanatory of the course of the vessels in each disease.

FIG. 5.—Operation for Artificial Pupil, rendered necessary by opacity of the cornea in the axis of vision: a needle has been passed through the cornea, by the curved point of which the ciliary connection of the iris has been torn away, and an artificial pupil thus formed through a part of its circumference. [To display the position of the needle, the corneal opacity has been only partially represented.]

FIG. 6.—Another mode of making an opening through the iris, where the pupil is closed, but the cornea remains transparent: it consists in passing a needle with cutting edges through the sclerotic; carrying the point through the iris into the anterior chamber; and then making an incised wound through the iris, to admit the passage of light to the retina.

FIG. 7.—True Pterygium, distinguished by its triangular form from Pterygium Pinque, Fig. 8.

Fig. 1

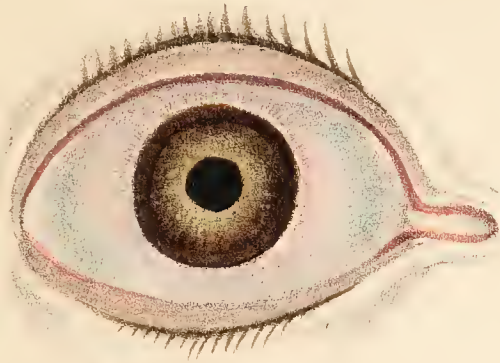


Fig. 2

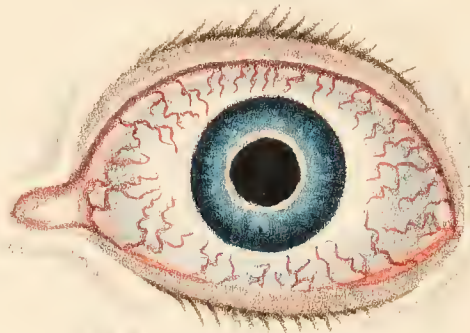


Fig. 3

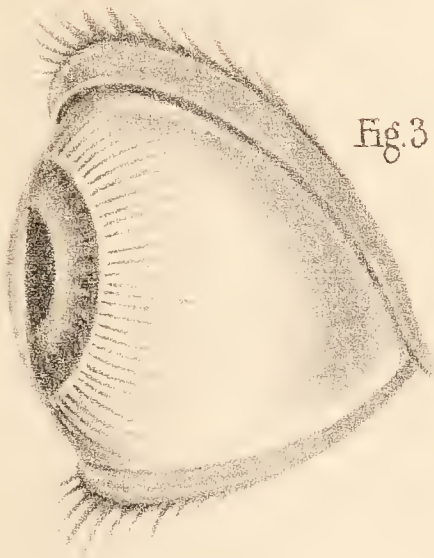


Fig. 4.



Fig. 6

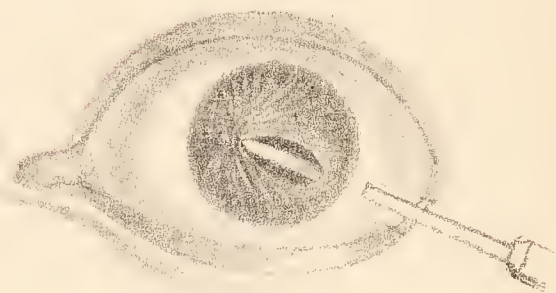
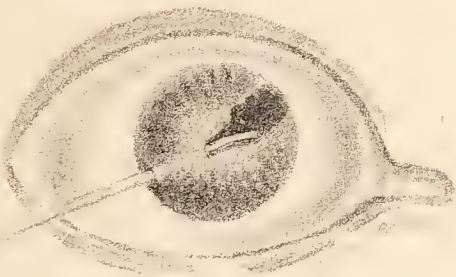


Fig. 7

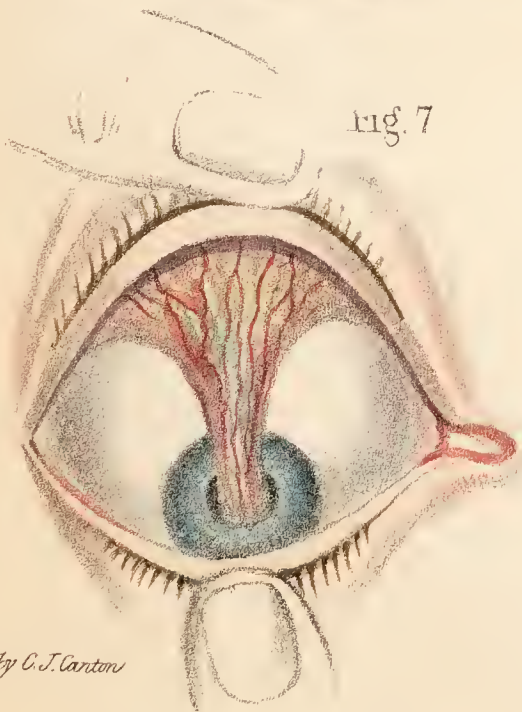


Fig. 8

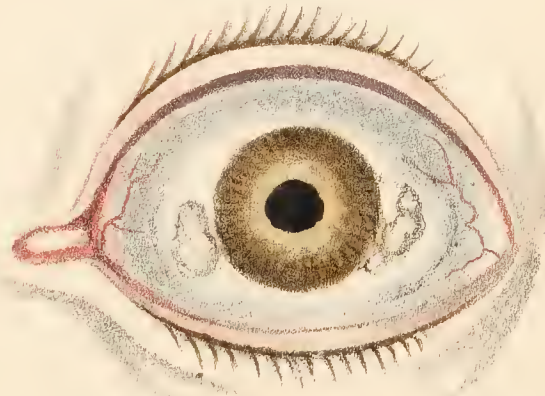








PLATE XVIII.

FIGS. 1, 2, and 3.—Different modes of opening the eye, described at page 24.

Fig. 2.



Fig. 1.

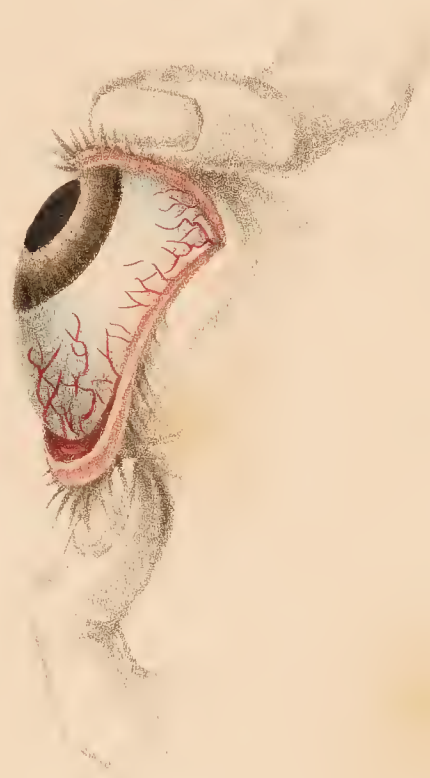
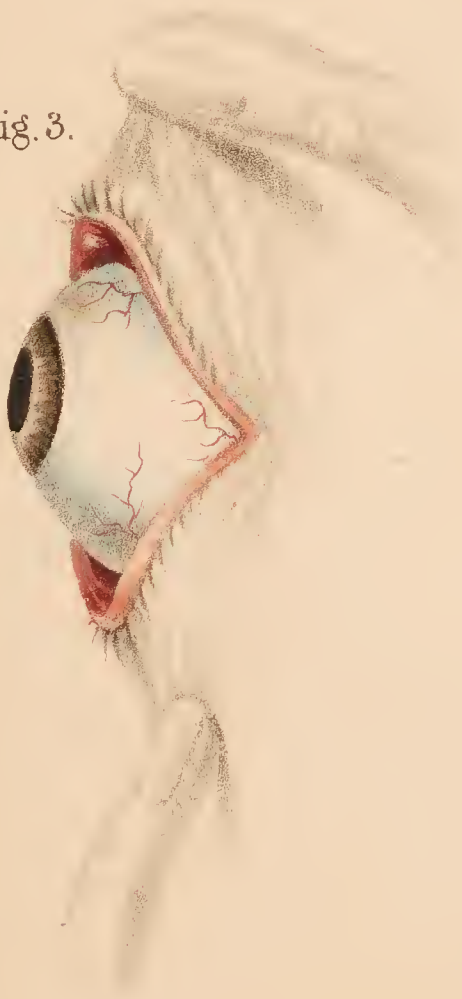


Fig. 3.







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